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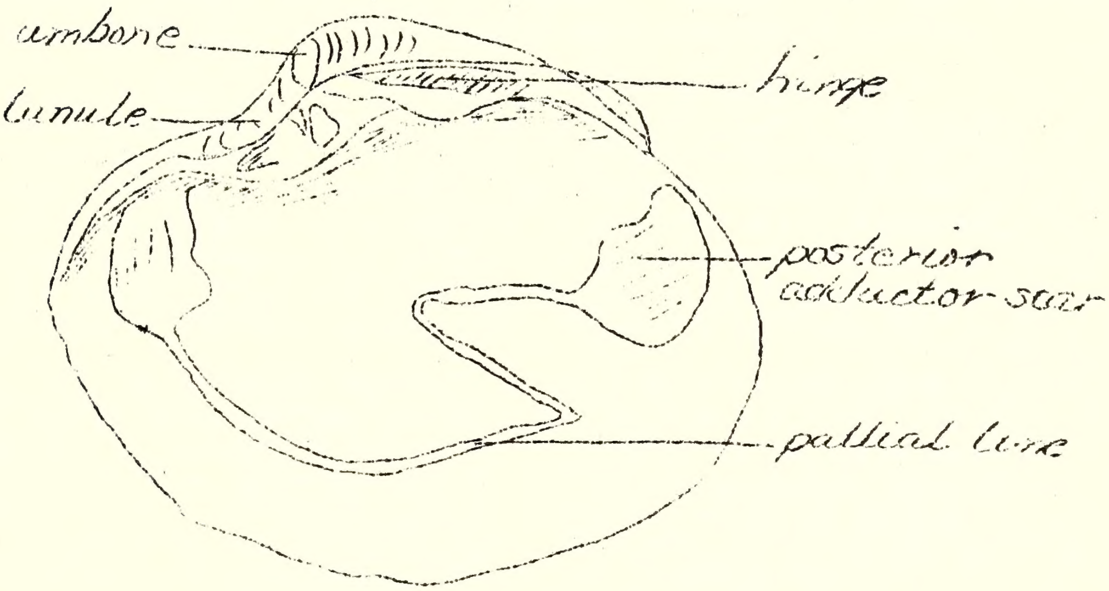
#59

BARTSCH COLLECTION

ILLUSTRATED GLOSSARY

PART I — PELECYPODA


umbone
lunule
hinge
posterior adductor scar
pallial line

by

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ILLUSTRATED GLOSSARY OF TERMS USED IN THE STUDY OF PELECYPODA

Introduction

Some of the following terms and definitions will seem ludicrous to the experienced conchologist. However, this is meant as well for those who are just beginning to work with molluscs and may not have an adequate background in science. We all started once with little knowledge of what was meant when we saw a description such as:

"Shell of medium size, thick, subcordiform; surface ornamented by several about equidistant slightly reflexed, low concentric frills and numerous rounded, radiating ridges, most prominent on the middle of the shell, which increase by intercalation and become flattened and less prominent as the periphery is approached; lunule prominent, ornamented by both incremental laminae and rounded, radiating ridges; hinge narrow; two prominent cardinal teeth in each valve; pallial sinus very shallow; margin crenulated. Length, 55; height, 50; diameter, 32."

All the words may be simple to you. To a beginner, many are just jargon which bewilder and cause one to hope that there is a good illustration present to explain those peculiar words. Unfortunately, many illustrations do not include all the points listed, so we are still at a loss and finally give up and just consult the picture instead of reasoning out the description. Then many of our shells are not labelled correctly, defeating the purpose of naming them.

Also, meanings have changed; terms have dropped out of usage since the earlier collectors first employed them. While taxonomy is stated more simply now, yet, the original description of shells must remain in the old, confusing terminology. In the bibliography you will note that there are several references of the early part of the last century. The average collector does not have access to many of those books from which terms have been culled and the illustrations of these definitions are taken mostly from our Pacific coast fauna.

You may wonder why there are so many terms listed which are not meant specifically for pelecypods. All of these terms were found in the common references listed and so must be understood in order to locate the shells at the beaches, to make clear the type of habitat in which the animal is found, or to explain the general structure and anatomy of the pelecypods. The latin terms (n. sp.), etc., are omitted as they can be found in any unabridged dictionary and so are easily found.

It is with great pleasure I acknowledge the criticism and help of my husband, Thomas A. Burch, with the illustrations and definitions and the choice of shells to all the Burch family. The time for this was made possible by Dr. Irene McCulloch under whom I was a research assistant at the Allan Hancock Foundation of the University of Southern California. Dr. Leo Hertlein and Mr. Allyn Smith at the California Academy of Science were most helpful. To all of these I extend my appreciation, while assuming sole responsibility for the many errors you will delight to discover.

BE Burch

GLOSSARY

abyssal region--comprises all of the deep-sea area below the archibenthis zone. It is deepest region in the ocean supporting carnivorous populations.
Plate I

accessory lamellae--shelly plates in the hinge of certain pelecypods.
Plate IV, figs. 8,9 Mactra

accessory muscle scars--small impressions found in addition to the usual muscle scars.
Plate VI, figs. 1, 2,3,4,5

accessory shelly pieces--see accessory shelly valves

accessory shelly valves--extra pieces of shells serving to close further the gape of the posterior and dorsal surfaces of the pholads. Syn. with accessory shelly pieces. See also hypoplax, mesoplax, metaplax, protoplax, siphonoplax.
Plate VIII, fig. 25 Parapholas

accremental striae--lines of growth formed by the addition of similar material showing progressive development in size and maturity. Syn. with incremental lines. See also sculpture.
Plate XXI, figs. 65, 66 Macoma

aculeated--covered with sharp points, prickles, or spines. See also sculpture.
Plate XII, fig. 39 Spondylus
Plate XXVII, fig. 83 Pteria
Plate VII, fig. 20 Pholadidea

acuminate--sharp terminal point. See also sculpture.
Plate VIII, figs. 22,23,24

acute--sharp-edged, pointed or angled.
Plate VIII, fig. 22 Nuculana edge
Plate VIII, fig. 24 Atrina edge and angles.

adductor muscle scars--depressions, usually circular, on the interior of the shell which mark the attachment area of the muscles controlling the movement of the two valves. There may be one, two, sometimes more.
Plate III, fig. 3 Amiantis
Plate VI, fig. 16 Pododesmus

adherent--attached, or permanently fixed valve or shell such as found in oysters, some scallops.

adnate--growing together. Example, the adnate gills of Verticordia.

alate--with winged-like projections.
Plate VIII, fig. 23 Pteria
Plate XXI, fig. 64 Pecten

alivincular hinge--defined by Dall as "more or less flattened cord extending from one umbo to another with its long axis transverse to the planes of the valve margins and the axis of motion". The hinge is usually amphidetic.
Plate XII, fig. 36 Lima
Plate XII, fig. 39 Spondylus

altitudo--the maximus distance between the ventral and dorsal margins measured perpendicularly between a plane parallel to the umbo and a plane parallel to the first touching the most extreme ventral margin. As defined by Keen "greatest vertical dimension, taken through the beak at right angles to a line bisecting the adductor muscle scars". Syn. with height.
Plate II, figs. 2a,2b.

amphidetic ligament--"type of ligament which extends on either side of the beaks". (Dall)
Plate VIII, fig. 22 Nuculana
Plate XII, figs. 36, 39 Lima, Spondylus
Plate XIII, figs. 40, 41 Cyrtodaria, Glycymeris

analogous--similar in function and differing in origin and structure; a species of one group similar in some characters to some species in another group; species, or genus closely related to another species of the same genus, or a genus of the same subdivision in another.

Anomalodesmacea--a group of burrowing pelecypods which have a rather nacreous, sometimes earthy texture of shell. They are frequently asymmetrical with subequal adductors high in the shell. They have small teeth or are edentulous and then often have a large chondrophore and resilium. The outstanding families:
Periplomidae
Thraciidae, Plate XIV, fig. 43
Pandoridae, Plate XVI, fig. 48
Lyonsiidae
Poromyacidae, Plate XVII, fig. 54
Cuspidariidae, Plate XIV, fig. 42
Verticordiidae, Plate XV, fig. 45
Corbiculidae, Plate XVI, fig. 47

Anomalodont teeth--small teeth or edentulous group of pelecypods, primitive borers.

anterior end--the end towards which the beaks point and which doesn't contain the pallial sinus. The end at which the palps are found.
Plate III, fig. 3 Amiantis

antero-lateral--the region where the anterior end and the ventral margin join.
Plate III, fig. 3 Amiantis

archi-benthic region-- is the zone extending from the sub-littoral to a depth between 800 and 1100 meters.
Plate I

appressed--pressed close to, or lying against, sometimes for its entire
length

arcuate--bent or curved like a bow. Seen in the family Arcidae.
Plate XIII, fig. 41 Glycymeris
Plate XVIII, fig. 56 Arca
Plate XIX, fig. 57 Glycymeris
Plate XXVI, fig. 81 Arca

articulated--in pelecypods refers to the interlocking teeth of the
hinge plate.

Asthenodonta--Cotton and Godfrey define as "borers and burrowers in which the teeth have become obsolete from disuse".
Plate VII, fig. 18 Pholadidea
Plate XXII, fig. 70 Parapholas

asymmetrical--shell which is bilaterally unequal
Plate VI, fig. 13 Siliqua
Plate XIV, figs. 42a, 42b Cuspidaria

attached--fixed to some solid object. Syn. with adherent. Note Chama, Hinnites, Ostrea, all have so-called "attached valves". Some shells are only temporarily attached. They may be attached by a byssus and so are capable of some movement. Examples of suchare Mytilus, Pecten, Atrina.
Plate IV, fig. 5 Pododesmus

auricle--little ear

auriculate--with eared processes such as are found in Pteria and Pecten.

auriform--shaped like the human ear.

attenuate--thin, slender, drawn-out processes.
Plate XIV, fig. 42 Cuspidaria
Plate VIII, fig. 22 Nuculana

aviculoid shell--syn. with alate shells.

B

basal margin--margin of the shell opposite the umbones. Syn. with
ventral margin.
Plate III, fig. 3 Amiantis

bathylimnetic--living or growing in the depths of lakes or marshes.

beaded--see also sculpture
Plate XXVII, fig. 85 Arca

beak--the umbone or upper projecting portion of the shells in the hinge area. Plate III, fig. 3 Amiantis
acute
anterior Plate VI, fig. 13 Siliqua
central Plate VIII, fig. 22 Nuculana
elevated Plate XX, fig. 62 Neotrigona
Plate XXI, fig. 67 Semele
Plate XXIV, fig. 73 Antigona
Plate XXVI, fig. 81 Arca
entire Plate X, fig. 29 Saxidomus
fissured Periploma
gyrate
high---see elevated
hooked Plate XX, figs. 63a, 63b, 63c Astarte
Plate XXIV, fig. 74 Arca
incurved Platydon
low Plate VI, fig. 13 Siliqua
Plate X, fig. 28 Tagelus
perforated Plate VII, fig. 18 Pholadidea
Plate II, fig. 1 Cardium
posterior Plate XVIII, fig. 55 Donax
prominent Plate XX, fig. 63 Astarte
Plate XXIV, fig. 73 Antigona
subcentral--Lithophaga, Botula
subspiral---Mytilimeria, Chama
terminal--Plate VIII, fig. 24 Atrina

bearded--group of hairs resembling a man's beard. Are long byssal or epidermal tufts.
Plate XXVII, fig. 93 Modiolus

benthos--division of the sea comprising all of the ocean floor from the wave swept land at flood tide to the greatest deeps.
Plate I

bialate--two winged

biangulate--two angles present on adjacent surfaces of a shell.

bifid--divided at the tip into two parts
Plate XVIII, fig. 55 Donax tooth
Plate IV, fig. 8 Mactra tooth

bilateral symmetry--having a form which may be divided by a central axis into two similar halves.

bimaculate--marked with two spots

binomial system--two name system first used by Linnaeus to distinguish closely related species. A general (group) name, the genus, and specific to that shell name, the species, differentiate between two species.

Example: Genus	species	author	year
Nuculana	leonina	Dall	1916
Nuculana	dalli	Krause	1885

bivalve--"two convex pieces (of shell) attached to one another dorsally
(1) by an elastic ligament external to the cavity between the valves; and (2) by muscles and connective tissues which pass from the inner surface of one valve to the inner surface of the opposite valve". (Dall)

blunt--cut off abruptly
Plate X, figs. 31, 32 Solemya (blunt posterior)

borer--pelecypods which live in rock or wood actively excavating their own hole.
Plate VII, fig. 18 Pholadidea

bosselated--covered with knobs. See also sculpture.
Plate XXVII, fig. 85 Arca
(more generally used in gastropod terminology)

branchia--gill

breadth--distance between the most convex parts of the two valves.
Plate III, fig. 4 Laevicardium

burrower--syn. with borer

buttress--a radiating ridge on the interior of the shell, serving to reinforce the hinge processes.
Plate X, fig. 31 Solemya

byssal notch--indentation found on the ear of Pectens and Pterias through which the byssus reaches the exterior.
Plate VIII, fig. 23 Pteria

byssus--beard-like, tough, hyaline filament formed by the animal of some pelecypods extending through the valve and used for temporary attachment to some solid object.

byssal ear--the ear on those species near which the byssus extrudes.

C

caducous--deciduous, parts which fall off very early or prmaturely.

calcareous--of shell substance, usually meaning calcium carbonate.

callum--"a calcareous structure closing the anterior gape in certain boring mollusks; found only in the adult or quiescent stage". (Keen).
Plate VII, fig. 20 Pholadidea

callus--a calcareous deposit such as enamel found in pelecypods
Plate IX, fig. 26 Gari
Plate XIII, fig. 40 Cyrtodaria
Plate VII, fig. 20 Pholadidea

cancellate--with radial and concentric ribs crossing. See also sculpture.
Plate XXVI, fig. 80 Protothaca

cardinal area--the area between the beaks and the hinge line. In specialized shells the anterior lunule is separated from the posterior escutcheon by the forward migration of the beak and backward migration of the axis of rotation.

cardinal plate--point of union between two valves. The infolded dorsal margin interlocking the two valves and serving as the point of union. Syn. with hinge plate.
Plate XIII, fig. 41 Glycymeris
Plate XVI, fig. 49 Perna (should be called Pedalion)
Plate XVI, fig. 50 Arca

cardinal area lacking--
Plate XVI, fig. 48 Pandora
Plate XIV, fig. 43 Thracia

cardinal teeth--see definition under teeth

carina--keel or ridge
acute umbonal ridge--Gari brazieri
high posterior dorsal--Yoldia scissurata

carinate--with a sharp keel or ridge

cartilage--"a translucent, elastic tissue which supplements the ligament in binding the bivalve shell together, it is attached to the resilifer or chondrophore and may be reinforced also by a calcareous coating called the lithodesma". (Keen)
Plate III, fig. 3 Amiantis

cartilage pit--see chondrophore

centimeter--a small unit of the metric measuring system consisting of one hundreth of the meter. An inch approximates 2½ centimeters.

chondrophore--"pit, or spoon-like form projecting from the hinge plate, generally supplemented by a special prop extending to the surface of the valve". (Dall)
Plate IV, fig. 6 Mactra
Plate IX, fig. 27 Schizothaerus
Plate XVII, figs. 52a, 52b Mya

ciliate--edged with parallel hairs which are very fine.
Plate XXVII, fig. 95 Volsella

circular--shells which are round in shape. Examples, Lucina, Diplodonta, Glycymeris.

calssification--Features used for taxonomy : (Twenhofel and Shrock)
1. Character of gills and associated soft parts.
2. Character of dentition, ligament and ligamental grooves, and resilium and resilifer.
3. Nature and position of the muscle scars, pallial line and pallial sinus.
4. Shape, size and ornamentation of the valves may be used, but always cautiously.

(continued next page)

classification continued--Modern zoologists base classification on the gill form and structure--leading to five orders.
Protobranchia, Filibranchia, Pseudomollibranchia, Eulamollibranchia, and Septibranchia
Most paleontologists use a classification based mainly in the nature of dentition, thus have three orders.
Prionodesmacea, Anomalodesmacea, Teleodesmacea.

clavate--"when one extremity of the shell is attenuated and the other becomes suddenly ventricose or globular". (Sowerby)
Plate XIV, figs. 42a, 42b Cuspidaria

clavicle--syn. with buttress

clithrum--"teeth specially modified for the vertical motion of the operculiform left valve, in which rotation is prevented by the projection of the modified teeth into deep sockets in the fixed valve". (Dall)
Plate XII, fig. 39 Spondylus ??

closed--bivalve shells which do not gape.
Plate XXIV, fig. 74 Antigona
Plate XXII, fig. 69 Tivela

compressed--flattened laterally, shallow shells
Pecten latiauratus, Macoma, Tellina, Pandora

concamerated--ovate chamber in the interior of each valve; an arched hollow near the hinge area.
Plate VII, fig. 19 Pholad

concave--hollow as opposed to convex

concentric--see sculpture

conchology--"science embracing the arrangement and description of molluscs based on a study of the hard parts". (Hawe)

conchyolin--the organic substance forming the shelly parts of molluscs.

connate--referring to valves firmly joined together from birth. Ex. Campanularia (a sub-genus of Unio)

convex--a rising or swelling to a spherical or globular form, curved roundly when seen from the outside.
Plate XXVI, fig. 79 Pecten for high and low convexity

cordate--heart shaped.
Plate XXII, fig. 70 Laevicardium
Plate XXIV, fig. 74 Arca

coriaceous--leathery, tough. See also epidermis.

costae--see ribs.

costated--ribbed
radial--Cardita
concentric--Pitar lupinaria

costule--little rib

crenulate--notched or regularly indented. See sculpture.
Plate XVIII, fig. 55 Donax
Plate XII, fig. 36 Spondylus
Plate XVIII, fig. 56 Arca

crura--the shank, any leg-like organ or structure. Syn. with buttress.
crural ridge Plate XVI, fig. 48 Pandora

crystalline style--a hyaline rod composed of proteins with amylolytic function, in the alimentary canals of molluscs. Found in Mytilus and in the Pholads particularly enlarged.

ctenidium or gill--stem carrying a nerve and blood vessel, from which on either side leaflets or slender filaments are given out laterally. It is so-called from its resemblance to a comb. Ctenidia are used in classifying classes of molluscs.

ctenolium--comb-like teeth in series used to keep the byssus from tangling and in separate threads.

cuneate--wedge-shaped. Plate XVIII, fig. 55 Donax

cuneiform--syn. with cuneate

curtain valves--?
are obsolete in Cuspidaria

cuspidate--prickly pointed. See also sculpture.
Plate XXVII, fig. 83 Pteria.
Pecten hastatus from Puget Sound shows many prickles.

cuticle--syn. with epidermis

cyathiform appendix--cyathiform is to be shaped like a little cup, widened at the top. It is lacking in Pholas.

Cyclodont--"special Teledesmacea where the teeth seem to spring from the cavity of the beak, and to be twisted into line in the cardinal margin". (Dall) Best seen in Tridacna, poorly seen in Cardium. See also teeth.

cylindrical--Transverse diameters are somewhat equal and are shorter than the length. Good examples are Botula and Lithophaga.

D

dead shell--more or less worn, obscuring the characteristics frequently, and which lack the living animal when collected.

deck--a small sheet of shelly substance connecting the anterior and posterior ends of the valve in the umbonal region.
Plate XIX, fig. 60 Septifer.

decussated--striae crossing each other at acute angles. Acila lyalli is a good example of this. See also sculpture.
Plate XII, fig. 38 Acila.

deep sea system--the area of ocean and ocean bottom below the continental shelf--the unlighted region of the ocean divided into an upper (archibenthic) and a lower (abyssal-benthic) zone.
Plate I

deflected--bent-backward or to one side.
Plate VII, fig. 18 Pholadidea

dehiscent--type of epidermis which bursts and comes off abruptly. See also epidermis.

dental callosity--amorphous thickenings which serve as teeth in edentulous pelecypods.

denticles--small, pointed or rounded tooth-like projections.
Plate XIX, fig. 61 Mytilus
Crenella, Dacrydium also have clear denticles.

dentition--arrangement and character of teeth and sockets of shells.
See teeth, also Prionodesmacea, Anomalodesmacea, Teleodesmacea.

denuded--destitute of covering.

depth--distance from a plane passing from umbone to ventral margin to a parallel plane extending the external surface of the shell. Valve will be thus "deep" or "shallow" according to distance between planes.

Desmodont teeth--???

dextral--right-handed

Diagenodont--"Normally the dentition is one or two laterals and three or less cardinals". (Twenhofel and Shrock).
Plate XX, fig. 63 Astarte

diameter--distance from the outside of one valve through to the outside of the other valve.

diaphanous--transparent, clear, pellucid.
Examples: Placenta sella, the "window-pane" oyster.

digitiform--finger-like. See also foot.

dilated--as used by Sowerby to mean expanded, spread. To be syn. with alate. More modern usage is spherical.

dimaria--molluscs which have both the anterior and posterior adductor muscle scars. It includes most of the pelecypods.
Plate III, fig. 3 Amiantis
Plate VI, fig. 13 Siliqua

dioecious--have separate sexes. Example Nucula.

Diogenodonta--group under order Teleodesmacea in which the lateral teeth are normally one or two, and the cardinal teeth are three or less, in any one group. It includes the following families: Diplodontidae, Eucrassatellidae, Lucinidae, Cyrenidae, Carditidae, Leptonidae, Chamidae.
Plate XX, fig. 63 Astarte
Plate XIX, fig. 59 Rochefortia

discoidal--flattened shell, the diameter in one plane approximately the same.

divaricate--syn. with diverge. See sculpture.

divergent--to extend in different directions from the same origin. Syn. with decussate, divaricate.

dorsal--refers to the region opposite the ventral, located at the umbonal area, or hinge area.

dorsal margin--the umbonal edge of the bivalve shell.
Plate III, fig. 3 Amiantis.

Dysodont--a group of the order Prionodesmacea comprising the Mytilus, Dacrydium, Crenella. Those bivalves with a series of denticles along the dorsal margin from which they arose as ornamentation.
Plate XIX, fig. 61 Mytilus
Plate XI, fig. 33 Crenella

E

ear--def. by Keen as "a triangular prolongation of a part of the dorsal margin".
Plate XIII, fig. 23 Pteria
Plate XII, fig. 36 Lima

edentate or edentulous--lacking teeth
Plate IV, fig. 5 Pododesmus
Plate VII, fig. 18 Pholadidea
Plate XI, fig. 34 Philobrya
Plate XIV, fig. 43 Thracia

elongate--the length greater than the height. Ex. Lithophaga, Tagelus,

elongate-ovate--long and rounded ends to shell.
Plate X, fig. 29 Saxidomus

end--terminal part of the shell.
long anterior end--anterior or head end extends to the umbone. Plate XIII, fig. 40 Cyrtodaria
long posterior end--Solen, Ensis, Siliqua

emarginated--Syn. with crenulated. "Notched or hollowed out. Applied to the edges or margins of shells, when instead of being level they are hollowed out, the ventral margin of some bivalves". (Sowerby)
Plate XIII, fig. 41 Glycymeris

embryology--that part of biology which deals with formation and development of immature organisms.

entire--without a sinus (referring to the pallial line). Syn. with integripalliate.

epidermis--"It is a fibrous outer covering of the shell" (Keen). It is syn. with integument and periostracum. See also periostracum.
caducous--Mytilimeria
ciliate
conspicuous
deciduous--syn. with caducous--Mytilimeria
dehiscent--Sanguinolaria, Tivela, Siliqua, Gari
fibrous--Crassatellites antillarum
fringe--Solemya
fucous
hairy--Plate XXVII, fig. 95 Volsella capax
hirsute--see hairy
hispid--see hairy
pilose
rough
setiferous--see hairy
shiny--Sanguinolaria
smooth--Nucula

equilateral--the two ends, posterior and anterior equal in size and shape.

equivalve--with valves equal in size and shape

escutcheon--"a circumscribed or depressed area along the dorsal margin posterior to the beaks". (Keen).
Plate III, fig. 4

expand--spread out wide

exserted--standing out, protruding

external--"an external shell is one which contains the animal and is not covered by the mantle". (Sowerby).

eulittoral zone--is the region extending from the high tide level to about 40-60 meters below the surface.
Plate I.

F

falcate--sickle-shaped, hooked, now moon shaped.
Plate XVI, fig. 48 Pandora

fasciated--"banded or striped" (Sowerby)

fascicle--a cluster, numerous filaments placed together

fasciole--a band of minute tubercles

fasset--"In bivalves a cavity of hinge to receive a tooth of the opposite valve". (Smith). Syn. with socket, the more usual term.

fathom--a nautical unit of measure, equal to approximately six feet.

fermature-- (of the mantle lobe) ??

fibrous--"A shell is said to be of a fibrous structure when a fracture would present a series of perpendicular fibers, such as Pinna". (Sowerby). "with layers of prismatic cells". (Smith). Also used to mean ciliate or hairy, though uncommonly.

Filibranchiata--conforms to the Prionodesmacea. "Two series of descending or direct filaments, one on each side of the stem carrying the blood vessel. It may be straight and not reflected, but more usually descend some distance and then are reflected upward externally. Typical ctenidium, exclusive of the stem, the filaments are connected with those adjacent to them only by interlocking cilia disposed in patches or upon enlarged distal ends of the filaments". (Dall).

filiform--thread shaped, long, slender and cylindrical

flabelliform shell--fan-shaped, radiating structure from a base or apex.

flaccid--relaxed, limber, lacking firmness

flange--an internal or external rib.

flat--see compressed

flexuose--zigzag without acute angles. "having windings or bendings" (Sowerby). Example, Tellinaceae are known by the twist or flexuosity in the posterior ventral margin of the shell.
Syn. with flexure (noun).
Plate XXI, fig. 65 Apolymetis
Plate XXI, fig. 66 Macoma
Plate XXI, fig. 67a Semele

fluviatile--inhabiting rivers

fluting--wide and gently sloping crenulations. See sculpture.

foliaceous--like plant leaves. See also sculpture.

foliobranchiate gill--greatly elongated and reflected ribbon-like plates on either side of the stem. Are fleshy and free. The Nuculoid type of gill.

foot--fleshy organ of locomotion, especially adapted in most cases for burrowing.
boring--Solenidae
clavate--Lucina
digitiform--Mytilus
expanded--Macoma, Trigonia, Lepton

(continued next page)

foot- continued
flat--Nucula, Yoldia
funicular--Pectinidae
geniculate--Cardium
keeled- Naiadacea
linguiform--Sphaerium
phalliform--Verticordia, Poromya
roptary--Nucula
triturating--Pholadidea

foramen--an opening
Plate IV, fig. 5 Pododesmus

fornicated--"Arched or vaulted, as the exfoliations on the costae of Tridacna elongata". (Sowerby). Concave within, convex without.

fossette--pit or receptacle for ligament. Syn. with resilifer.
posteriorly inclined--Cuspidaria

fragile--tender, easily broken

free shell--an unattached shell, not attached by byssus or growth of shell structure or position.

free valve--"In attached bivalve shells, one only is fixed; the other is then free, as far as to the action of opening and (closing) shutting". (Sowerby).

fresh-water shells--"(sometimes described as aquatic) are those which inhabit rivers, running pools and ditches, in which case they are fluviatile; or wells or ponds of standing water, etc. Fresh water shells are either thin and horny in their texture, as the Lemmeana of Lamarck; or are covered with a compact, smooth, horny epidermis". (Sowerby).

frills--see lamellae

fringe--type of epidermis which extends over the edge of the mantle margin side of the shell.
Plate X, figs. 31, 32 Solemya.

fulcrum--portion of bivalve shell to which cartilage proper is attached.
Plate III, fig. 3 Amiantis

fulvous--tawny brown, a mixture of gray and brown. See Laevicardium quadragenarium, or Gari alba.

funicular--shaped like a small cord or band.

fuscous--brown or grayish black color.

G

gape--"chink or opening between valves when in the colsod position" (Keen). Plate XXII, fig. 68 Parapholas Schizothaerus, Panope, Solen sicarius

geniculate--bent like a knee joint, such as a Cardium foot shows.

genus--a group of closely related organisms which are a unit of the larger family subdivision and which are composed of one or more species.

gerontic type--type verging upon extinction.

gibbous--swollen.
Plate XXII, fig. 70 Laevicardium
Plate III, fig. 4 Laevicardium

gill--a breathing organ which can obtain the air that is contained in the water. It is paired and located in the dorsal part of the animal, surrounding the heart and part of the viscera.

glabrous--surface is smooth, opposed to hairy
Plate XXII, fig. 69 Tivela

globular--sphere shaped

glochidium --a larval stage of pelecypod young, found only in certain groups.

granulated--covered with grain-like elevations

gregarious--living in company with others of its kind. Pecten, Ostrea, Mytilus, Sanguinolaria.

growth lines--see accremental lines. Also see sculpture.

H

habitat--the locality or region where an animal or species usually lives.

haemolymph--a fluid found in the coelom of some invertebrates, is somewhat comparable to blood of the vertebrates.

hairy--rough, with prominent fibers. Syn. with hirsute, hispid, setiferous

height--see altitude

herbivorous--feeds on plants

hermaphrodite--an organism having both male and female reproductive organs in one individual.

heterodont--"with one or more hinge teeth on the dorsal margin; cardinal teeth radiate from that part of the hinge plate immediately below the beaks; lateral teeth (not invariably present) are anterior or posterior to the cardinal area". (Keen) See teeth.

Heteromyaria--a division of pelecypods containing very small anterior adductor muscles. Example Mytilus.

hians--gape--(noun)

hinge--the infolded dorsal margin interlocking the two valves and serving as the point of union.
Plate II, fig. 1 Laevicardium
buttressed hinge--some Cuspidaria
edentulous--Anomia
interior--Solemya Plate X, fig. 31
rectilinear--Arca
undulate--Pleurodon

hinge plate--the area of the hinge.
reflexed--Pholadidea

hirsute--see hairy

hispid--see hairy

holotype--the original shell or shell fragment described by the author to determine the type species or type genus. Note, the holotype of a genus is merely the type species and not a specific shell.

homologous--corresponding structures between organs of different organisms due to differentiation by evolution from the same or corresponding part or organ of some remote ancestor. Example of homology are the forearm of man, foreleg of horse, pectoral fin of fish.

homeotype--"A specimen compared with the type and found to be cospecific with it". (Schenk and McMasters)

Homomyarian--syn. with Dimyarian

hyaline--transparent to translucent, clear, horny material. Ex. Atrina.

hypoplax--accessory shell piece between the valves ventrally on some of the burrowing clams.
Plate XII, fig. 37 Parapholas

I

imbricating teeth--teeth which overlap each other, shingled. See teeth.

immaculate--without spots.

incrossated--"thickened, as the hinge of Glycymeris". (Sowerby).
Plate XIII, fig. 41 Glycymeris

incremental lines of growth--"faint concentric lines resulting from the process of growth of the shell". (Keen). Syn. with accremental lines. See sculpture.
Plate XXI, fig. 66 Macoma
Plate XXI, fig. 67 Semele
Plate XV, fig. 44b Thyasira

incumbent lips--closed lips such as in Venus.

incurved--bowed inward

indented--"Exactly the reverse of dentated, meaning a series of small cavities, such as might be produced by the entrance of teeth. The cast of a dentated surface would be indentated". (Sowerby)

inequilateral--"A term applied to a bivalve shell when its extent on one side of the umbone is greater than on the other. When the sides are nearly equal, the term sub-equilateral is used". (Sowerby). "With anterior and posterior halves of the valves dissimilar in shape and size". (Keen).

inequivalve--"The two principal valves differing from each other in diameter or convexity". (Sowerby).
Plate XXVI, fig. 79 Pecten.

inferior valve--"That which is attached to submarine bodies. Only applied to attached bivales". (Sowerby).

inflated---"Swelled, as Bulla. This term can only be applied to rotund shells of a light, thin, texture. In other cases we should use the word ventricose". (Sowerby).
Plate XI, fig. 33 Crenella
Plate XII, fig. 36 Lima

inflected--margin turned inward

inshore (neritic) province--is a division of the pelagic area consisting of the water above the continental shelf and which joins the oceanic water. Syn. with neritic.
Plate I.

insinuate ventral margin--infolded

integripalliate--having an entire pallial line.
Plate XXIII, fig. 71 Psephidia

integument--the outer covering. Syn. with epidermis.

intercalation--growth which takes place other than at the apex or site of usual origin.

intergrade--some organisms, usually being found at either extremity of their range and named as distinct species are found to be merely variants in color or minor structural points of one species. These species then are said "to intergrade" or fuse through varieties or subspecies and are not separate species.

interlocked shell margin--crenulated, or fluted margin.
Plate III, fig. 4 Laevicardium.

internal shell--"is one in which is enclosed in the soft parts of the animal, as a bone is enclosed in the flesh of a human body" (Sowerby).

interspaces--spaces between the ribs, described as shallow and narrow.
Syn. with interstices.
Plate XXI, fig. 64 Pecten

interstices--syn. with interspaces

intertidal zone--area bounded by the high and low water extremes of the tides.

iridescent--reflecting the prismatic colors. Example, the interior of Mytilus, Nucula, Atrina.

irregular shells--"are those which, being attached to, or imbedded in other marine bodies, have no constant form, but are modified in shape accroding to the substances to which they are fixed". (Sowerby). Chama, Hinnites.

irrorate--marked with very minute grains or specks of color.

Isodont--"internal resilium with (in left valve) first a socket and outside of a strong tooth in each side of the pit; and, in the opposite valve, corresponding teeth and sockets". (Dall). "With two ridges or crura diverging from below the beaks and bounding a central resilifer". (Keen).
Plate X, fig. 30 Pododesmus (one extreme)
Plate XII, fig. 36 Lima
Plate XII, fig. 39 Spondylus (other extreme)

K

keel--a longitudinal ridge, a carina

L.

lamella--thin plates or foliations. See also sculpture.
concentric, distant erect--Venerupis kennerleyi
incremental--Tellina idae
strong--Protothaca succincta

lamina--syn. with lamella--Plate XXVII, fig. 84b Perna

laminated layer--innermost pelecypod shell layer, composed of calcite or aragonite and is secreted by the entire mantle surface.

lanceolate--long and spear-shaped.

lappets--little flaps or lobes

lateral--to the right or left of the mid-line of the body.

lateral teeth--teeth, which when present, are anterior or posterior to the cardinal area. See teeth.

layers of shell--there are three types of shell secretions, laid down by the animal. The outer is the periostracum, middle is prismatic, the innermost is the laminated. See those terms.

left valve--the valve to the left when the specimen is held with hinge area up and the pallial sinus or siphons point towards the observer.

length--"greatest horizontal dimension of the shell parallel to a line bisecting the adductor muscle scars and at right angles to the height". (Keen)
Plate II, fig. 2b, see line EF
"measurement of shell from anterior to posterior end in bivalves described in these pages; sometimes designates the distance from cartilage or umbones to the base; in univalves, the point of spire to base". (Smith).
Plate II, fig~~s~~. 2a See line AB

lenticular--depressed, but keeled as in Modiolus.. Double convex.

ligament--"horn, tough, semi-translucent beneath its external surface. When dry has a vitreous fracture and often shows hardly any fibrous textures". (Dall).
"Ligament generally refers to the external and resilium to the internal band between the dorsal margins of the valves". (Dall). "A band of tough, elastic fibers which unites the two valves of a bivalve molluck; it is variously situated along the dorsal margin, internally or externally, and may or may not be supplemented by cartilage". (Keen).
anterior to beak--Cuspidaria
external--Calpytogena, Astarte, Chama, Tellina
internal--Crassatellites, Crassinella (see resilium)
ligament behind teeth--Astarte Plate XX, fig. 63
obsolete--Verticordia Plate XV, fig. 45

ligamental ridge--syn. with nymphae

lineated--marked with lines. See sculpture

linguiform--tongue like. See foot.

lirae--small striations. See sculpture.

lirate--grooved and ridged in a parallel manner. See sculpture.

lithodesma--syn. with ossiculum and ossicle. "An accessory shelly plate which sometimes covers and reinforces the ventral side of the resilium".(Keen). Note---it is only visible from the inner surface of the shell and is not connected it it, hence in worn or dead shells, it may not be evident or even present.
Plate XVII, fig. 53 Entodesma
Plate XVIII, fig. 57 Entodesma

litterate--lettered with irregular lines like the arabic writing.
Plate XXVII, figs. 88, 89

littoral--the upper system of the benthic division comprising the eulittoral and sub-littoral zones.

livid--pale purplish brown. "Bruise" color, brownish-black.

lobate or lobed--divided into parts.

locotype--a shell from the locality where the holotype was obtained.

longitudinal--direction of the longest diameter.

lucid--bright, clear

lunate--crescent-shaped, or falcate, lunulate

lunulate--"Moonshaped, having the form of a crescent. Applied most frequently to muscular impressions". (Sowerby). Syn. with semi-lunar, lunate, falcate.

lunule--a heart-shaped, circumscribed or depressed area in front of the beaks.
cordate--Plate III, fig. 3 Venericardia
deeply impressed--Plate XV, figs. 45a, 45b Verticordia
depressed--Plate XXIV, fig. 73 Antigona
lanceolate--Psephidea lordi ovalis
small--Plate XXV, fig. 79 Cardita
strongly excavated--Lucina excavata
wide--Plate XXV, fig. 77, 78 Pitar

lurid--dirty-yellow

lutose--covered with dirt or mud.

M

maculated--spotted

mammillar--rounded or domed

mantle--in molluscs and brachipeds, the outer layer of tissue which secretes the shell from marginal glands around the edge. It contains pigment glands and is ornamented with papillae, tentacles, sometimes even visceral glands.

mantle cavity--the space between the mantles and the body of the mollusc containing the respiratory organs.

mantle edges papillose--found in the Cardiidae
mantle edges geniculate--Cardiacea

mantle gland--pillar shaped body found in the posterior end of the Pinna serving to keep that area of the shell and mantle free of grit.

margaritiferous--pearl-bearing

margin--edge of shell. Types of margin are:
closed Plate XXII, fig. 69 Tivela
gaping Plate XXII, fig. 68 Parapholas
interlocked Plate XXII, fig. 70 Laevicardium

marginal--near the edge or periphery of the structure

marmorate--resembling marble

median--middle, along the axial plane

mesoplax--accessory shell piece above the umbone of some Pholads
Plate VIII, fig. 25 Parapholas

metaplax--accessory shelly piece behind the umbone of some Pholads
Plate VIII, fig. 25 Parapholas

meter--an international unit of measurement nearly equal to a yard. It is 39.36 inches. Two meters are equivalent to one fathom.

millimeter--a small unit of the metric system consisting of one-thousanth of the meter or approximately one-twentififth of an inch.

miniatus--red, like red-lead

Mollusca--a phylum of coelomate, unsegmented invertebrates passing through a Trochosphere and Veliger larval stage, possessing bilaterally symmetrical bodies and bivalve shells, univalve shells, or no shells. They have a heart, lacunary (partly) closed circulation, mouth, intestine, anus, nervous system with at least three pairs of ganglia connected by commisures. They reproduce by sperm and ova; have gills, move by foot, swimming, or parapodial structures. They are either monoecious or dioecious, but are incapable of self-fertilization. Molluscs are divided into five classes: Pelecypoda, Scaphopoda, Gastropoda, Amphineura, and Cephalopoda.

monomyaria--one muscle scar present, such as in the oysters.

monotype--the holotype of a species which was described from a single specimen, hence the only representative of its genus at the time of publication.

mucous pores--organs which supply and lubricate the surface of the body.

mucronate--terminate in a sharp, rigid point

multivincular hinge--"Reduplication of the alvincular type at intervals upon the area, either amphidetically or upon the posterior limb of the cardinal margin". (Dall)
Plate XVI, fig. 49 Perna
Plate XVI, fig. 50 Arca

muricated--syn. with spinose. Armed with sharp spines.

myophore--"Along, curved, sickle-shaped or spoon-shaped process on the interior of the shell beneath the beaks and behind the widened dorsal margin serving as a plate of attachment of certain muscles of the foot". (Keen) "Supports visceral mass and enormous fleshy palpi". (Dall)
Styloid myophore--Zirphaea
Plate VII, figs. 18, 19, 21 Pholadidea

mytiliform shell--shaped like Mytilus

N

nacre--iridescent layer of shell found on the interior of certain mollusca. Syn. with iridescence. Ex. are found in Pinna, Mytilus, Crenella, Ostrea, Nucula

nacreous--with a pearly, iridescent luster

naked-- without a shell

navicular--boat-shaped

nekton--swimming animals found in the pelagic area which can migrate freely over considerable distances.

neotype--syn. with genotype; type by subsequent designation, or by elimination. It is chosen subsequently to the loss of the original type material. It must come from the original locality.

nephridia (organs of Bojanus)--excretory organs independent of the alimentary canal.

neritic--see inshore

nestler--those animals which seek protection in sponges, clay, seaweeds, among dead shells, etc. which are not active burrowers. Examples, Sphenia, Protothaca nidamental--concerned with the act of laying eggs, especially the formation of egg shell or covering.

nitidus--clear, brilliant, luminous, bright

nodose--with knobbed ribs. See sculpture.

nodule--knob-like small projections.

nuclous--first formed portions of the cones which emerged from the egg.

nymphae--ligamental fulcra or thickened ridges upon which the ligament attaches in the pelecypod shells.
without rugosities--Transenella
nymphae clear in Petricola carditoides

O

oblique--"With greatest dimension transverse to a plane passed vertically through the beaks". (Keen).

obsolete--disappearing or no longer present

ocelli--light perceiving organs found especially clearly in the Pectens.

oceanic province--is a division of the pelagic area consisting of open sea descending about 200 meters or to the upper limit of the lower dark zone.

oculiferous--bearing an eye or eyes

olfactory organs--organs of smell called osphradia

olivaceous--olive color. Example is Nucula.

opaline--bluish white, like the color of opals.

opaque--not possible to see light through it. See also texture.

open sea--see oceanic

opisthodetic--type of ligament which has been withdrawn wholly behind the beaks. Example, Thracia, Tellina

opisthocoelous--beak concave behind (Posterior)

opisthogyre--twisted posterior beak

opisthopodium--"An accessory fin-like organ developed at the posterior end of the visceral mass. It is accessory to the foot". (Dall).

oral area--"extends from the anterior end of the cardinal line to the anterior end of the pedal area". (Zittel).

orbicular--round and flat

order--a group of phylogenetically similar organisms. This division ranks between the family and the class.

organs of Bojanus--see nephridia

orthogyre--beaks directed towards each other. See Cardium.

osphradia--olfactory organs.

ossicle--syn. with lithodesma .

ossiculum--syn. with lithodesma.

otocysts--sac which contains the auditory organs.
pervious otocysts--Nucula

ovate--shaped like an egg

ovate-subquadrate--rounded and somewhat foursided. Example, Panope.

ovigerous--egg-bearing mollusc, the eggs hatching after leaving the body. Syn. with oviparous.

oviparous--see ovigerous.

ovoviviparous--produces eggs with well developed membranes, but which hatch within the body of the mother, thus the young are born alive.

P

paleoconcha--"group of ancient pelecypods with a single living species, Acharax, which have shells without teeth of any kind". (Twenhofel). They may have polymorphous teeth formed by modifications of the margin and not set upon a hinge plate.

pallets--"A pair of simple or compound calcareous structures at the siphonal end of certain wood-boring molluscs, used to close the burrow when the siphons are withdrawn".(Keen). Plate XI, fig. 35 Bankia.

pallial line--"A linear impression connecting the adductor muscle scars, marking the attachment of the mantle margin to the shell". (Keen).
Plate III, fig. 3
integripalliate--Thyasira, Verticordia
sinupalliate--Amiantis, Tagelus, Pitar, Gari

pallial sinus--"acurved embayment in the pallial line" (Keen). It marks the attachment of the muscle that retracts the siphon.
Angulate--Plate XXIII, fig. 72 Transenella
deep--Venerupis tenerrima, Tellina reclusa
linguiform--Plate III, fig. 3 Amiantis
shallow--Verticordia
obtuse--Mytilimeria
short--Plate XXIII, fig. 71 Psophidia lordi
sinuate--Tellina

pallium--the mantle

palpi--leaf-like expansions of the integument, which are ciliated internally and serve to conduct food from the gills to the mouth.

Pantodonta--"Ordovician and Silurian type of dentition which seems to antedate Teleodont development. There are cardinals and laterals, the cardinals grooved and the laterals more than two". (Twenhofel).

papillae--any small nipple-like projection. Example, on the siphons of Verticordia, also the gills.

papillous--surface with dots or pimples

parasite--an organism living within or on another to its own advantage in food and shelter.

paratype--"a specimen, other than the holotype, upon which an original specific description is based". (Frizzell). It may be from a different or the same locality as the holotype, and either the same or different sex.

parivincular hinge--"Cylinder split on one side, attached by the severed edges, one edge to each valve. Long axis corresponds with the axis of motion or vertical plane between the valves; always opisthodetic". (Dall) Ex. Tellina, Gari.

patulous--open, distended, expanded

pearly--opalescent, see also texture

pectunculoid shell--?

pedal area--between the oral and siphonal area. It extends backward to where the branchial crest forms the anterior boundary of the siphonal area.

pedal ganglion--ganglion or nerve nucleus controlling the foot movements. It is distinct in Nucula.

pedal muscles--the protractor muscles.

pedunculated (radial cardinal) teeth--stalked teeth. Ex. Tagelus pelagic--referring to life in the open sea, in the surface layers of the water.

pelecypoda--A class division of the phylum mollusca.

pellucid--clear, transparent

pennaceous--feathered, like the webs of a plume.

perforate--pierced openings

periostracum--syn. with epidermis. Usually thin, frequently absent, outermost shell layer protecting the calcareous parts of the shell from solution.

phalliform--shaped like the phallus or penis.

pholads--clay or rock boring pelecypods which have a myophore.

phylum--a great division of plants or animals, ranking below a sub-kingdom and above a class.

pilose--usually referring to epidermis which is soft, thickly covering hairs. See epidermis.

plaits--folds

plankton--all the floating or drifting life of the pelagic division of the sea. Some are capable of weak locomotion.

plano-convex--see convex.

plastotype--cast of a type. It is reproduction for distribution of rare specimens.

pleural ganglion--distinctly seen in Solemya.

plication--fold such as in a fan. Syn. with plait.

plug--horny byssal material which attaches Anomia to rocks through the foramen.

porcellanous--a texture of shell which is shiny and smoothly white. See texture.

posterior--the part of the shell behind the umbone when the beak is pointing forward. If the sinus is present on the mantle impression, it is always on the posterior part of the shell.
attenuated posterior--Lyonsia californica
Plate III, fig. 3 Amiantis
Plate X, fig. 28 Solen

primary teeth--cardinal teeth or the central teeth beneath the beak. See teeth.

Prionodesmacea--product of evolution applied to the development of teeth transverse to the hinge margin, of crurae or of amorphous teeth. The main types of this order are Taxodont and its considered derivatives of Schizodont, Isodont, Dysodont. Families are:
Solemyacidae Plate X, fig. 31
Nuculidae Plate XII, fig. 38
Nuculanidae Plate VIII, fig. 23
Limopsidae
Arcidae Plate XIII, fig. 41; Plate XVI, fig. 50
Pinnidae Plate VIII, fig. 24
Pteriidae Plate VI, fig. 14; Plate XXVII, fig. 83
Pedalionidae Plate XVI, fig. 49
Dimyidae
Ostreidae
Pectinidae Plate XXI, fig. 64
Limidae Plate XII, fig. 36
Anomiidae Plate IV, fig. 5
Mytilidae Plate XIX, figs. 60,61;

Prionodont--"valves are markedly inequilateral so that the anterior cardinal margin is much shortened, and also by simultaneous umbonal torsion, the rib endings and their dental processes become curved". (Dall).

prismatic layer--middle layer of pelecypod shell secreted by the free edges of the mantle lobes.

prodissoconch--"Embryonic shell of pelecypoda, corresponding to the protoconch of gastropods". (Dall)

produced--drawn out, elongated

procoelous beak--hollow forward (with a lunule). Ex. is Astarte.

prosodetic ligament--"In general, when the ligament becomes opisthodetic the remnant of the area in front of the beaks forms the lunule. The escutcheon may or may not be homologous with the posterior part of the original area". (Dall).

prosogyrate--turned anteriorly. See beaks.
Plate XV, fig. 45a, 45b Verticordia

protractor scars--anterior, depressed muscle scars made by the muscle which exserts the foot.

protoplax--accessory shell piece in front of the umbone in some of the pholads.

provinculum--a primitive hinge of certain young pelecypods

pseudocardinal teeth--found in the Unionidae

pseudo-lunule--found in the Lucinas.

punctate--the surface dotted with minute holes. See sculpture.

pustule--a pimple or blister-like quality. See sculpture.

pyriform--pear-shaped.

Q

quadrangular--having four sides and four angles. Ex. Glans

quadrate--square.

R

radial- lines extending from the umbones or beaks to the ventral margin of the valve. See sculpture.

radicated--"attached, and as it were rooted by means of a fibrous byssus". (Sowerby).

ray--ridge extending and reinforcing the shell from the umbone towards the ventral margin. Syn. with buttress
Plate X, fig. 32 Solemya
Plate VI, fig. 13 Siliqua
Plate XVI, fig. 48 Pandora

rectilinear--in a straight line.
hinge--Plate XVI, fig. 50 Arca

rectum- the terminal part of the intestine

recurved-- bowed downwards

reflected--bent backwards, folding upon itself. Syn. with reflexed.

reflexed--see reflected

remote--"Remote lateral teeth in a bivalve shell, are those that are placed at a distance from the cardinal teeth". (Sowerby). "the lateral teeth of Laevicardium are remote; those of Donax are near". (Sowerby)
Plate II, fig. 1 Laevicardium
Plate XVIII, fig. 55 Donax

reniform--kidney-shaped

reptary foot--"Deeply grooved foot, which can be expanded so that the sides of the groove when in one plane will form a surface upon which the animal may crawl, or with which it can push". (Dall). See foot.

resilifer--"A triangular or rectangular structure below the dorsal margin of the valve, for the reception of the resilium". (Keen). posteriorly inclined--Plate XIV, fig. 42b Cuspidaria.
spoon-shaped Plate XII, fig. 36 Lima
submarginal

resilium--"A triangular ligament structure residing in a pit along the inner hinge margin". (Keen). "Distinctly lamellar or composed of parallel fibers which are apt to give a pearly sheen at its broken surface. Often is a more or less extensive intermixture of lime usually deposited along the median plane". (Dall). That intermixture is generally called a lithodesma. See lithodesma.

reticulate--net-work like structure.

retractor muscle scars--a pedal muscle scar found dorsal and a little anterior to the larger muscle scars. Not often easily seen.

rhombic--a parallelogram whose angles are unequal and whose adjacent sides are unequal.
Plate XXVII, figs. 93, 95 Modiolaria

rib--thick, internal or external strengthening structure extending from the umbones to the ventral margins. Syn. with buttress, ray, bifurcating costae.
Plate X, fig. 31 Solemya
thick, internal rib--Tellina buttoni
intercalated rib
external rib--Pecten
primary rib--Pecten

ribbing--alternate denticulation of the margin. Syn. with crenulation, indentation.

right valves--the valve to the right when the specimen is held with the hinge up and the pallial sinus or siphons extending toward the observer, or with the beaks pointed away from the observer.
Plate II, fig. 2

rimate--having fissures

ripples--concentric, flat, prominent lines of growth. See sculpture.

rostrate--"produced into a beak-like process". (Keen).

rostrum--beak-like projection, usually at the anterior of the shell.
attenuate--Cuspidaria, Plate XIV, figs. 42a, 42b
short, broad--Thracia trapezoides Plate XIV, fig. 43
unicarinate--Ledella

rotundate--round, spherical

rufous--red or pale red

rugae--wrinkles or folds in sculpture. See sculpture.

rugose--wrinkled or creased

rugosity--interlockings on the cardinal margin of the valves, such as seen in the teeth of Chama.

S

sagrinate sculpture - - ??

salient--jutting out, prominent

scabrous--rough Plate XXVII, fig. 83 Pteria

scale--syn. with costae of some Limas.

scallop--the vernacular for the genus Pecten

scalloped--indented

Schizodont--variable teeth, often obscurely divided into sub-umbonal and lateral. They are usually heavy and amorphous. Ex. Naidae, Trigonia.

sculpture--the pattern of raised or depressed markings on the surface of the shell formed by permanent or temporary modifications of the mantle margin.
- accremental--Plate XXI, fig. 66 Macoma
- aculeated--Plate VII, fig. 18 Pholadidea
- beaded--Plate XXVII, fig. 85 Arca
- bosselated--Plate XXVII, fig. 85 Arca
- cancellate--Plate XXVI, fig. 80 Protothaca
- concentric--Plate XXV, figs. 77,78 Pitar
- crenulate--Plate XVIII, fig. 55 Donax
- cuspidate--Plate XXVII, fig. 83 Pteria
- decussated--Plate XII, fig. 38 Acila
- divaricate--see decussated
- fluted--Tridacna
- foliaceous--Plate XXVII, fig. 82 Spondylus
- frilled--Tridacna, Chama
- granulated
- incremental--see accremental
- lamellated--Protothaca
- laminated--Plate XXVII, fig. 83 Perna
- lineated
- lirated
- muricated--see spinose
- nodose--Plate XXVII, fig. 85 Arca
- nodulated--see nodose
- plaited
- punctated--Plate XVI, fig. 48 Pandora
- pustule
- radial--Plate XXIV, fig. 75 Cardita
- reticulated--Chione
- ribbed--Pecten
- rippled--Plate XX, fig. 63 Astarte
- rugated
- rugose
- sagrinated

sculpture continued--
- scabrous
- shagreen--Lepton
- spinose
- spinulose
- squamated
- squamose
- striated
- strigose
- sulcate
- wrinkled--Plate XXVII, fig. 86

securiform--hatchet-shaped. Example the foot of Cardium

semi--half
- semi-cordate--half heart shaped
- semi-lunar--half moon shaped

serrate--evenly jagged and sharp margin such as found in a saw edge in the Cardiidae .

sessile--fixed, without power of movement; attached without a stalk.

setiferous--hairy. See epidermis.

shell--hard, outer covering composed of calcareous, silicious, horny, or chitinous material secreted by the animal and which serves to protect the more delicate inner organs.

shell gland--an embryonic structure which secretes the embryonic shell. It is a single organ, rather saddle-shaped.

side--see lateral surface.

simple--"Single, entire, uninterrupted, undivided" (Sowerby).

sinistral--left, as opposed to dextral or right.

sinuous--twisted

sinupalliate--having an indented pallial line

sinus--excavation, indentation. See also pallial sinus.

siphon--"a tubular structure through which water enters and leaves the animal". (Johnson and Snook). "mantle edge, though not actually connected are sometimes so folded as to practically form two tubes, by one of which water enters and from the other the water is discharged". (Dall). In some pelecypods, the two tubes are joined, though they may be separate or partially separate in others. They vary in size and length and are always retractile, though not always entirely into the shell.

siphonal area--dorsally bound by an angle in the incremental line posteriorly and ventrally by the shell limit.

siphonal scar--syn. with pallial sinus.

siphuncle--a small siphon

siphonoplax--a calcareous trough which is sometimes attached to a corneous appendix in the posterior extremity of Pholad valves. Plate XII, fig. 37 Parapholas

slope--the face of the bivalve, anterior, lateral, posterior.

socket--pit into which fits the tooth of the opposite valve.
socket bipartite--divided into two parts.

soleniform--shaped like Solen, or, that is, an old-fashioned straight razor.

species--a group of closely allied individuals. It ranks above the variety or subspecies and is a division of the genus rank.

spinose--armed with sharp spines. Syn. with muricated. See sculpture.

spinulous--bearing spines. See sculpture.

spiral--wound around an imaginary axis.

spirgyrate--pointed outward, perhaps, also twisted.

spur--an elongated shelly process such as is found originating in the top portion of the cardinal area of Mactras which does not articulate with any structure in the opposite valve and has the flat surface parallel to the hinge plate.

squamose--"scaly, covered with scales". (Sowerby)

squamation--scaled.
Checkered squamation--macroscopic network.

Steinman formula--See Dall, Free Inst. Sci. for elaboration. L= left and R= right valve. The teeth are represented by units. Sockets into which the teeth of the opposite valve fit by zeros. Resilium or chondrophore = c. Lateral teeth = L. Clasping laminae M1 or M2 if double. Feeble teeth = italicized symbol for normal teeth. Amorphous, interlocking masses, which can't be classified as teeth = x. Where two taxodont rows meet on one hinge margin, and aren't separated by a resilium = a period. Examples:

Venus mercenaria $\frac{\mathrm{LX01010}}{\mathrm{RX1P1P1}}$ Unio batavus $\frac{\mathrm{L\ M2X0X}}{\mathrm{R\ M0X0}}$

stellate--star-shaped. Stellate disk in Solemya.

striated--marked in rows with fine grooves or raised lines. See also sculpture.
feeble--Crenella strong--Modiolaria

strigose--syn. with striated

styloid--pen-shaped

sub--under or less.
sub-cordiform--Anadara
sub-circular--Lucina

subgenus--a group of closely allied individuals, varying only slightly from the larger group of genus. There may be one or several sub-genera in a genus.

sub-littoral zone--extends from the eulittoral lower limits of 40 to 60 meters down to about 200 meters, the edge of the continental shelf. See plate 1.

sub-orbicular--not quite round

sub-reptary--"ungrooved foot, which can be expanded as a plane". (Dall).

sub-trigonal--not quite triangular. Example Donax.

subulate--awl-shaped.

sulcate--forrowed or grooved. See sculpture.

sulcus--a groove.

suture--lines of separation between incremental growth lines.

symmetrical--shells which have similar anterior and posterior ends.

synonym--identical in meaning. Schenk and McMasters define the purpose of synonomy in species description to give the history of the nomenclature of the species and the author's conclusion as to the validity of the names applied, giving all published scientific names by which the species has been known, and bibliographic references to all previous descriptions or descriptive references.

T

tactile--feeling organ

tautonymy--in the binomial system, a name in which the genus and species are identical. Ec. Gibba gibba.

Taxodonta--hinge plate composed of serially alternating teeth and sockets mostly similar in form and size.
Plate XIII, fig. 41 Glycymeris
Plate XVIII, fig. 56 Arca

taxonomy--the study of the laws of classification.

teeth--"Projections from the dorsal margin of one or both valves which engage corresponding sockets from the opposite valve".(Keen).
anterior--Aligena
cardinal
bifid--Plate XVIII, fig. 55 Donax
chevron--Plate VIII, fig. 22 Nuculana
curved--Yoldia
divergent--Pandora
elongated
posterior Plate XVI, fig. 51 Cardita
oblique--Plate X, fig. 29 Saxidomus
primary
small--Tellina
posterior--Lucina
transversely striated--Cardita
comb-like
conical--Plate XV, fig. 45 Verticordia
concrescent
cyclodont
desmodont
feeble
heterodont
imbricating--Plate VIII, fig. 22 Nuculana
lamelliform--Vesicomya
lateral--Plate IV, figs. 8,9 Mactra
feeble--Calyptogena
obscure--Taras
posterior
pseudolateral--Antigona fordi
strong--Codakiidae
obsolete--Plate X, fig. 30 Pododesmus
pectinidial--Pecten latiauriatus
pustular--Kellia
reflected
subulate--Plate VI, fig. 13 Siliqua
serial--Arca
striated--Neotrigona--Plate XX, figs. 62a, 62b

Teleodesmacea--"Segregation of teeth into different classes on one hinge plate, including, especially, the utilization of lateral teeth parallel to the hinge margin". (Dall). "Formed a hinge plate and to separate the guiding, or cardinal teeth from the fixative, or lateral laminae". (Dall).
Includes the following types of teeth:
Teleodont, Pantodont, Diagenodont, Cyclodont, Asthenodont.

Teleodont teeth--Are the highest developed type of dentition in the pelecypods. The most primitive teleodont teeth merge into and resemble the diagenodont formation. There are a few large cardinals with or without laterals. Ex. Venus, Mactra.

terminal--"at the extreme end, especially with reference to a cylindrical or ovate shell". (Keen).
terminal groove on foot--Solemya.

tesselated--"(wrought in chequer-work). A term applied to the colouring of shells, when arranged in regular defined patches like a tesselated pavement." (Sowerby). More usually found in Gastropods.

testaceous--shelly

texture--type of layers of constituent parts.
opaque
pearly
porcellanous
translucent
transparent
vitreous

topotype--"A specimen from the original locality from which a species was described. Topotypes are of great importance as they are often the only clues to the identity of a "lost" or doubtful species". (Frizzell)

torsion--twist or rotation of one part or structure in relation to another.

transverse--lying across or at right angles to the axis of the body.

translucent--light can be perceived through it; form and structure are indistinct. See also texture.

transparent--light, form and structure are distinct through it. See texture.

trapezoidal--a four-sided figure with two parallel sides.

trigonal--shell more or less triangular in shape.
Plate VIII, fig. 24 Atrina.

thick shell--referring to the shell substance which is heavily laid down resulting in a shell usually vitreous. Ex. Chama,

thin shell--lightly laid down shell, resulting in an easily broken shell. Ex. Lima, Macoma, Solen.

tricarinated posterior slope--three keeled slope. Ex. Cyathodonta undulata.

triturating organ--see crystalline style.

trochiform--free swimming larval stage of embryo. It is conical in shape with a crest and girdle of cilia.

trochosphere--the noun for the above embryo.

truncate--abruptly terminate.
Plate XIV, fig. 43 Thracia

tube--hollow cylinder. Term frequently applied to the siphons.

tubular shell-few pelecypods are tubular. There are a few exotic forms though, one valve tubular and the other like a lid closing the open end. Ex. Humphreyia strangei Adams from Australia.

tubercules--small projections.

tumid--swollen, distended abnormally, inflated, bloated, turgid, ventricose.

turgid--syn. with tumid

type--in a restricted sense, it is the holotype of a species (or genotype) of a genus, more generally it is any of the original type material.

type material--"all original material used in the description of a species, as well as all material used to supplement the description". (Frizzell).

U

umbone--"Lateral prominence above the hinge and beak. The beak is the terminal extension of the umbo and can best be seen in the interior view of the shell; the umbones are seen only in the lateral or exterior view of the shell".(Keen).
closed
curved--Plate XXIV, fig. 73 Antigona
decumbent
depressed--Plate VIII, fig. 23 Pteria
erect--Plate XI, fig. 33 Crenella
fissured--Periplomidae
free
spiral
straight
subspiral

undulated--waved, curved

unicarinate--one keel

V

valve--one of the calcareous pieces which forms the shell

variety--"a group within the species differing consistently from the type in some minor respect". (Johnson and Snook).

veliger--the second larval stage of certain molluscs. It has a swimming organ, the velum.

ventral--the lower side of the body; opposite of dorsal.

ventral margin--the margin opposite the dorsal or beak region.

ventricle--the chamber in the heart which forces the blood through the body.

ventricose--swollen, distended. Syn. with tumid.
Plate XXIV, fig. 75 Cardita
Plate XXIV, fig. 74 Arca

verrucose--many small wart-like structures on the animal surface

viscera--occupies the dorsal part of the shell and contains the heart, intestinal canal, generative organs, renal and other glands.

viscid--covered with resinous or greasy matter.

vitreous--see texture

viviparous--bring forth living young.

W

wedge-shaped--see clavate

width--see diameter

wrinkled--with fine foliations or irregularly disposed ridges on the surface. See sculpture.

Z

zooplankton-- animal plankton

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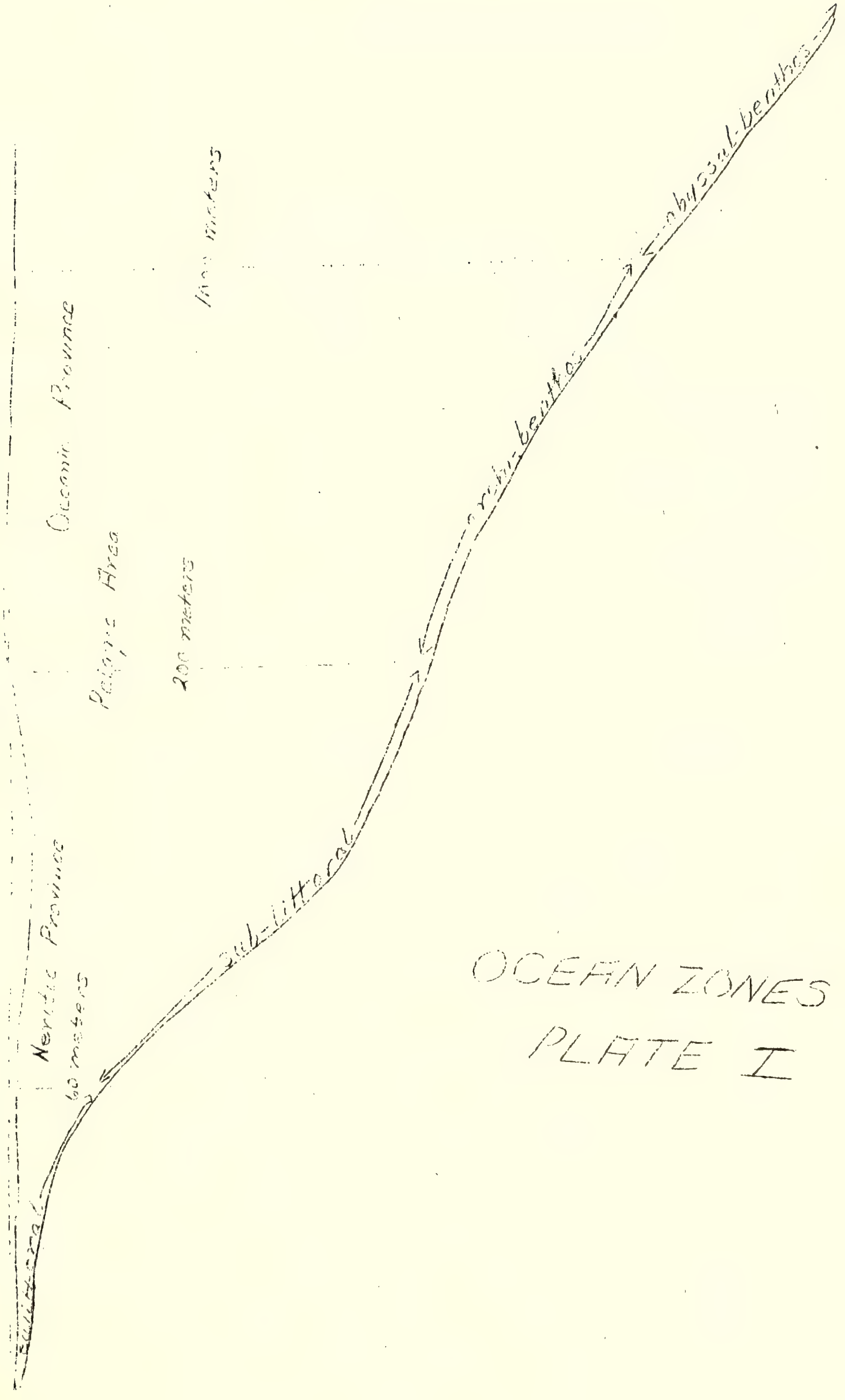

Neritic Province
60 meters
Pelagic Area
200 meters
Oceanic Province
1000 meters
littoral
sub-littoral
archi-benthos
abyssal-benthos

OCEAN ZONES
PLATE I

PLATE II — GENERAL TERMS

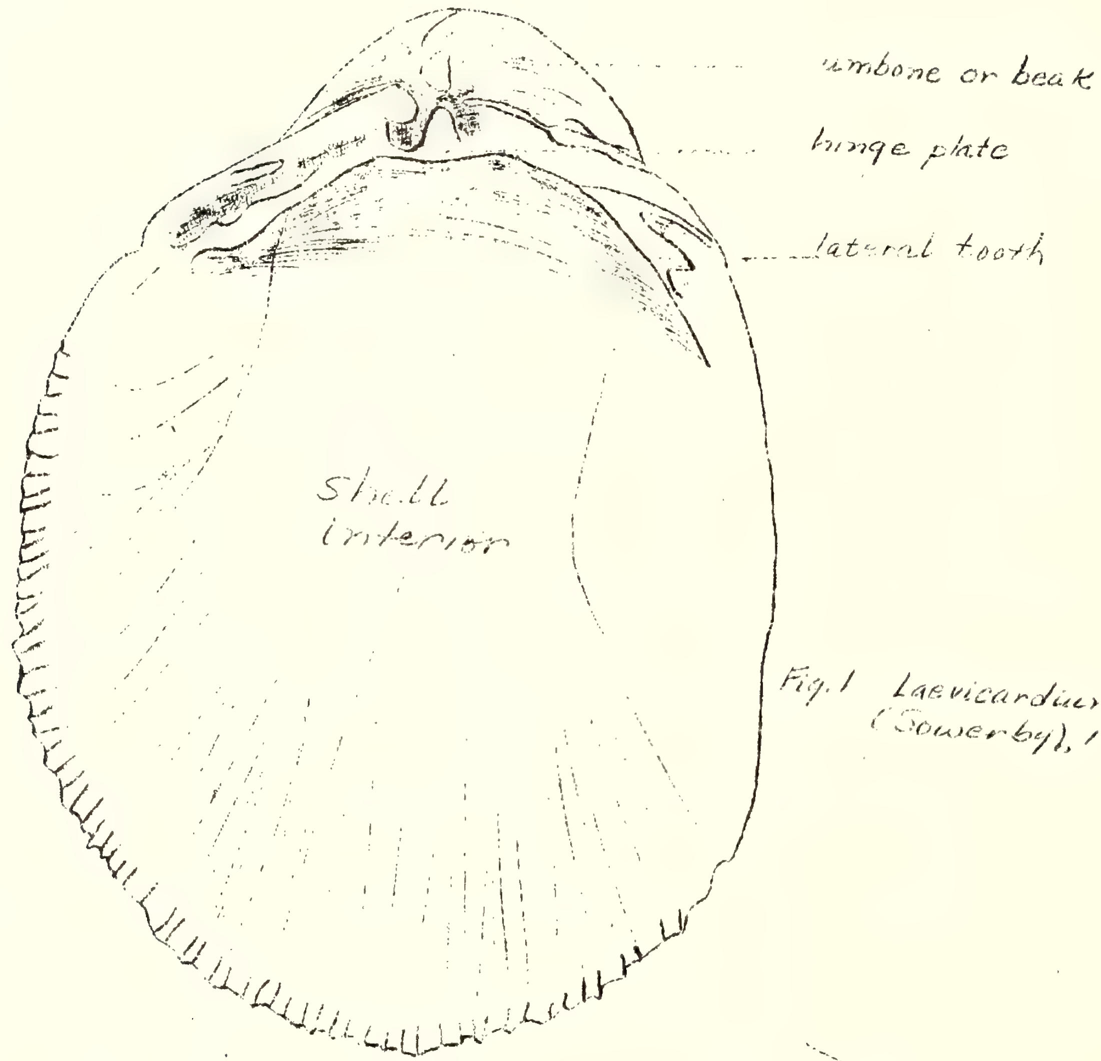

umbone or beak
hinge plate
lateral tooth
Shell interior

Fig. 1 Laevicardium elatum (Sowerby), 1833

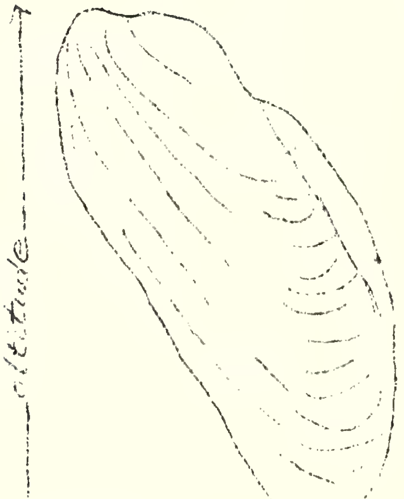


Fig. 2a

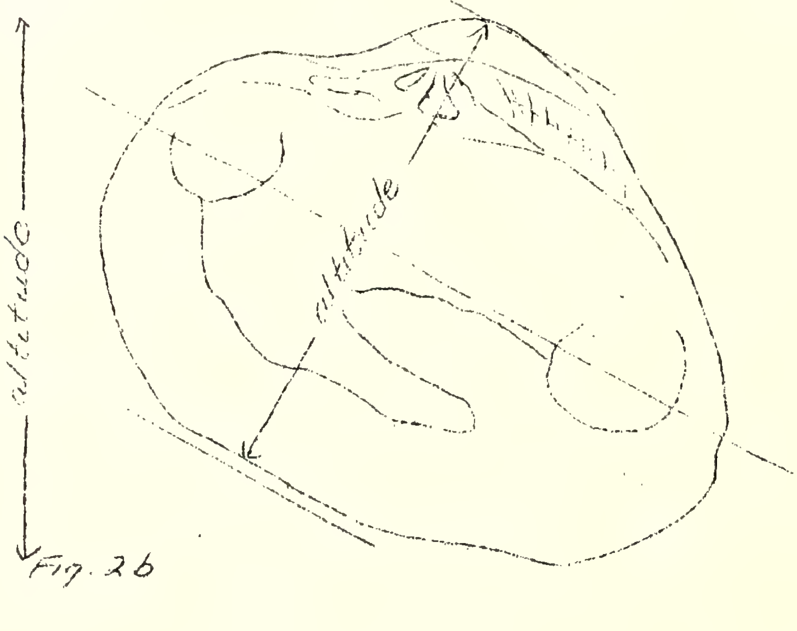

altitude
altitude

Fig. 2b

PLATE III GENERAL TERMS

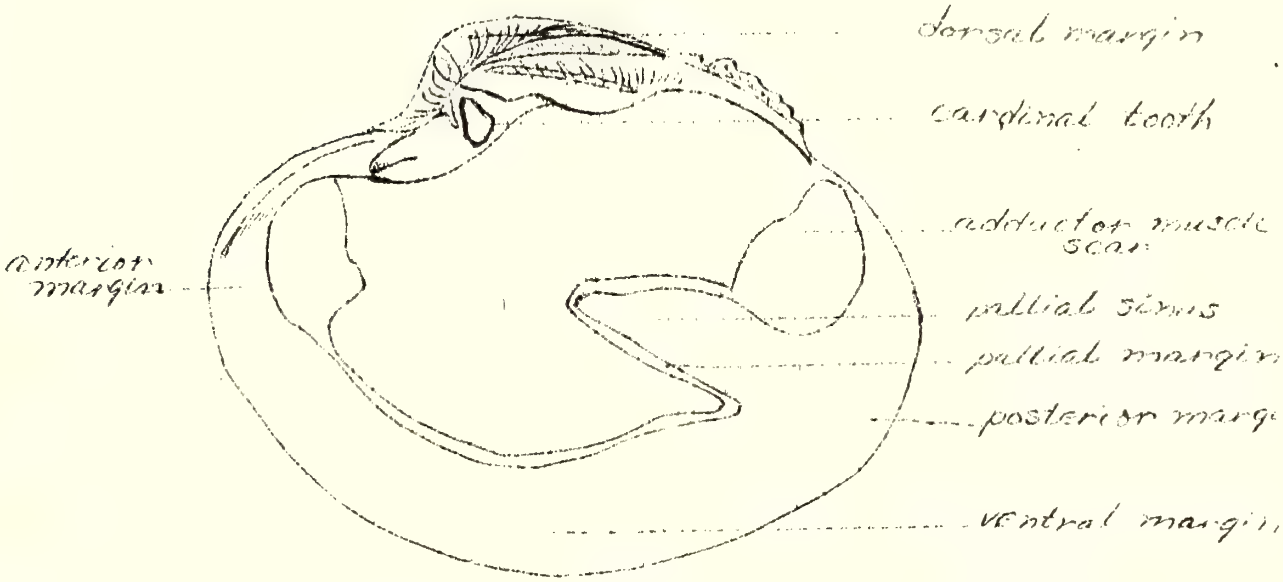

dorsal margin
cardinal tooth
adductor muscle scar
anterior margin
pallial sinus
pallial margin
posterior marg
ventral margin

Fig 3 - Amiantis callosa (Conrad), 1837 x1

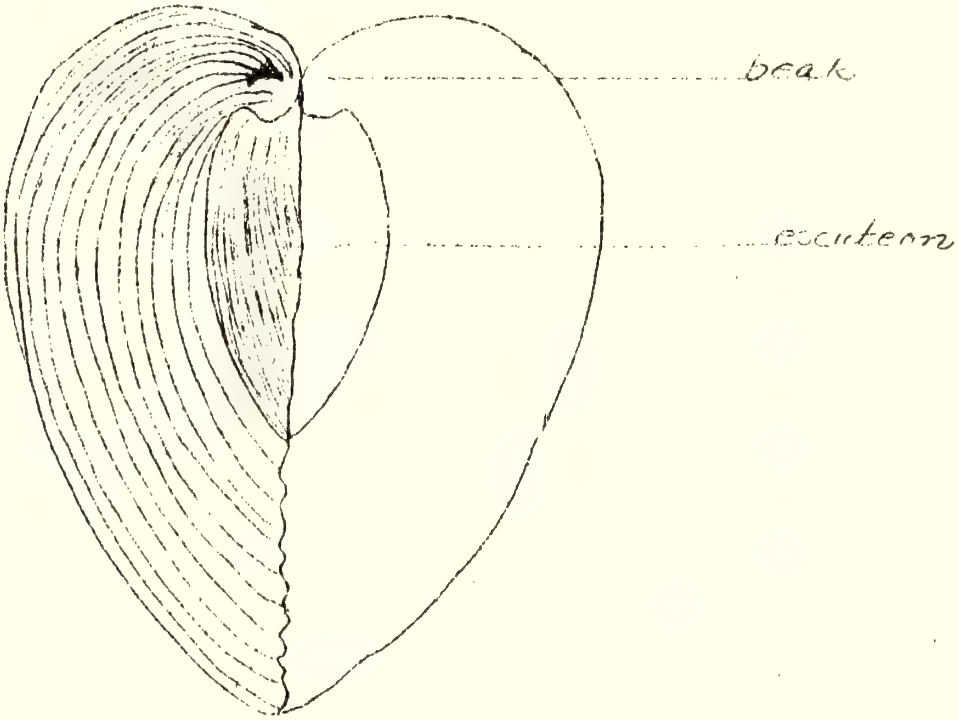

beak
escuteon

Fig. 4 - Laevicardium elatum (Sowerby), 1833 x ½

PLATE IV

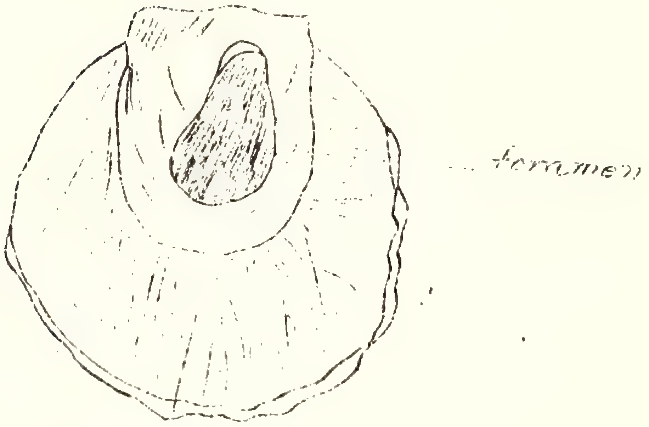


Fig. 5 - Pododesmus macroschisma (Deshayes), 1839 X1

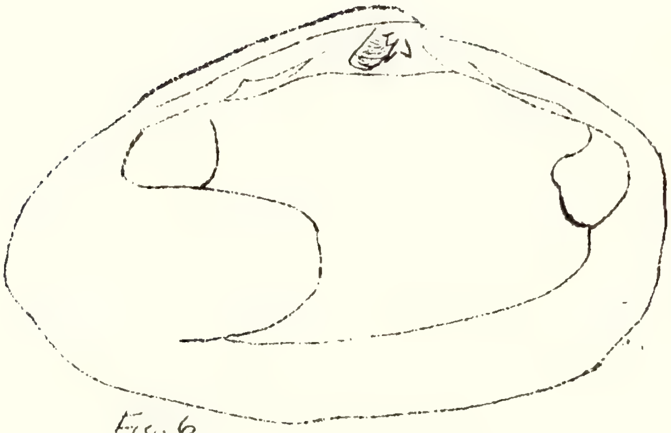


Fig. 6 x 3

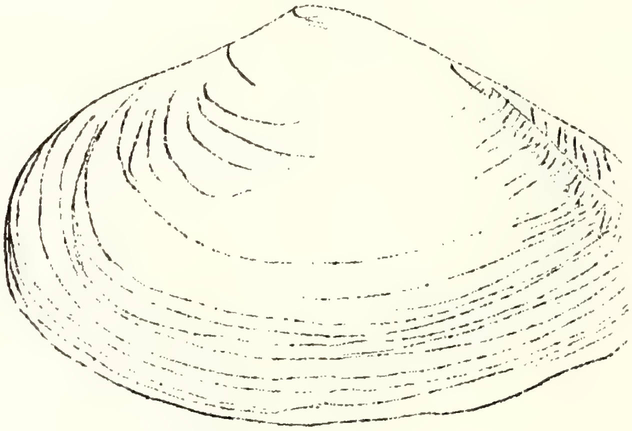


Fig. 7 x3

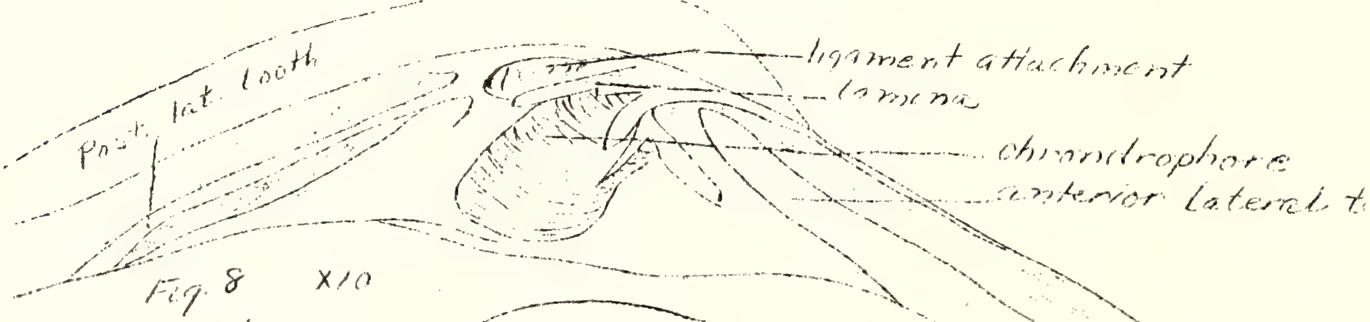

Post. lat. tooth
ligament attachment
lamina
chrondrophore
anterior lateral t

Fig. 8 X10 left hinge

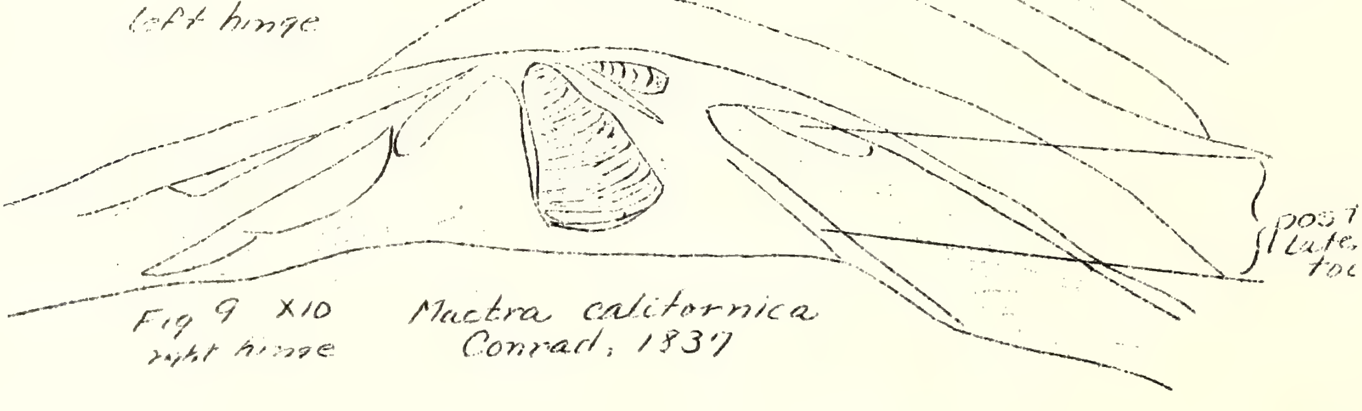

post
late
too

Fig 9 X10 right hinge

Mactra californica Conrad, 1837

PLATE V

Schizothaerus nuttallii (Conrad). 1837

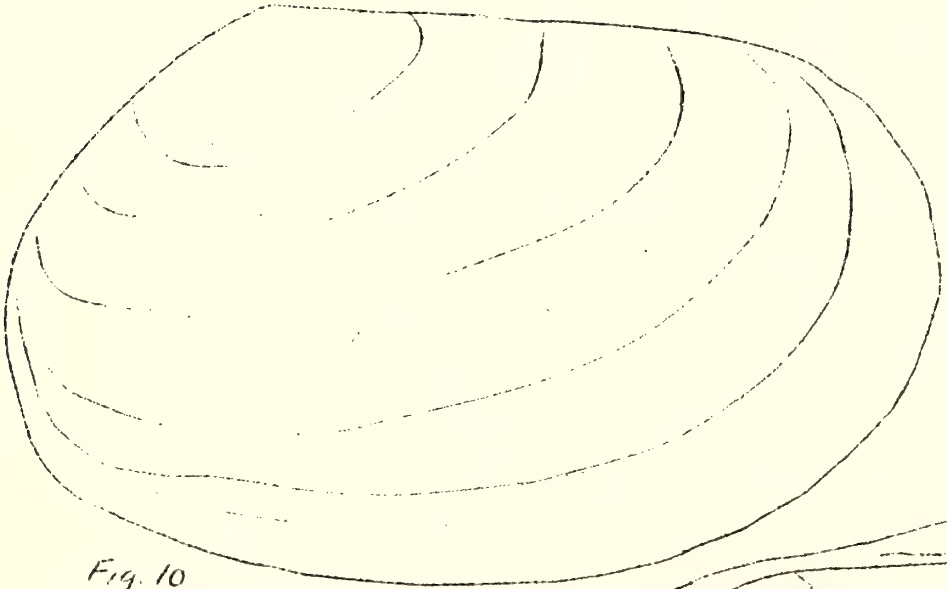


Fig. 10
left valve exterior
X1

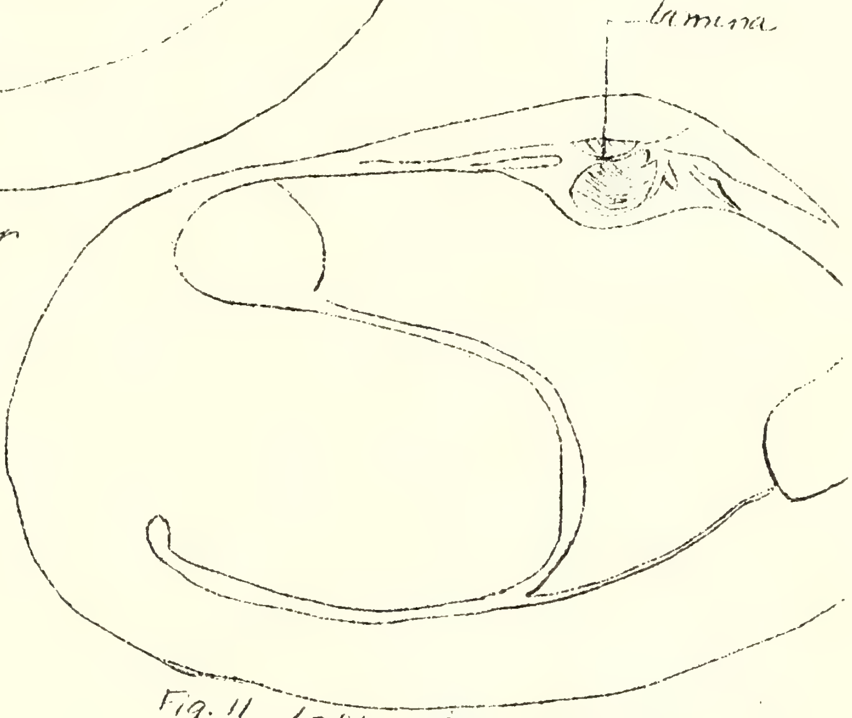


Fig. 11 left valve interior X1

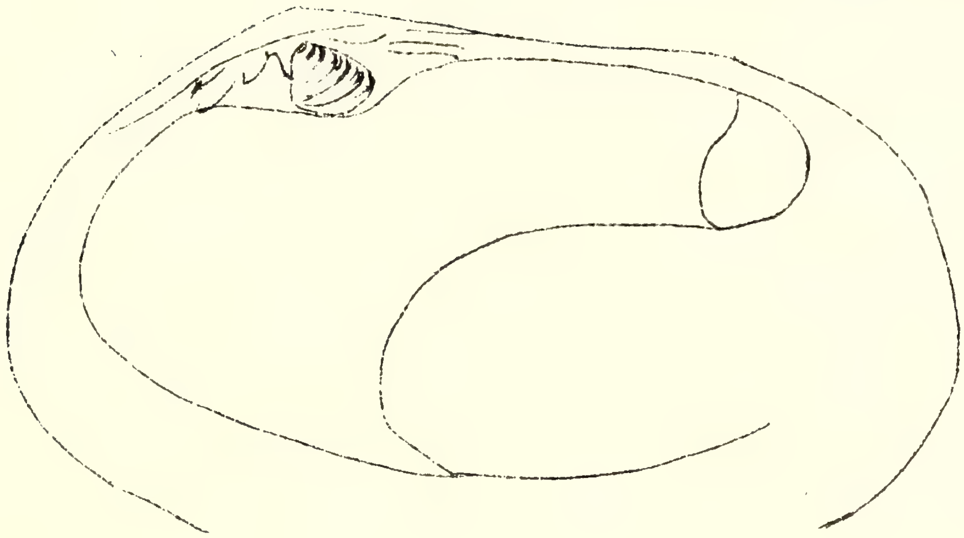


Fig. 12 right
X1

PLATE VI

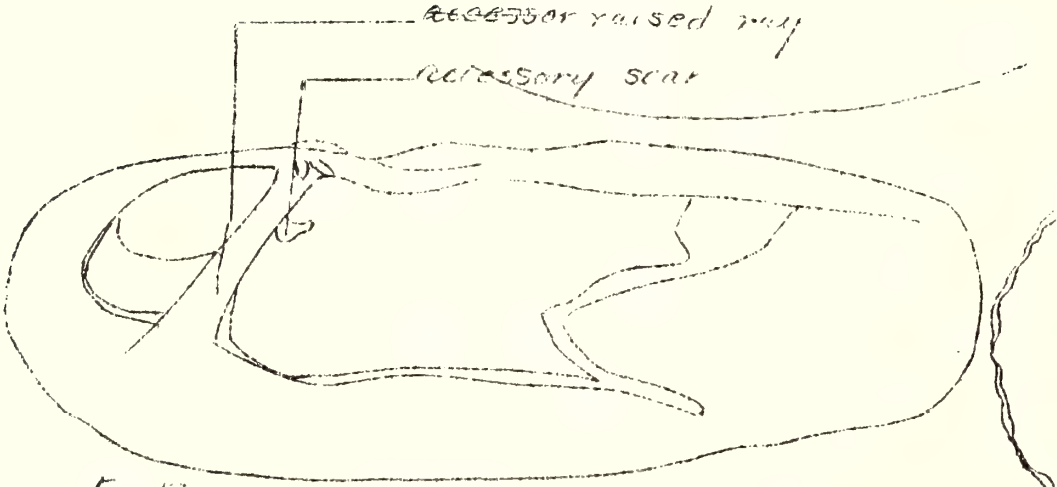

~~accessor~~ raised ray
accessory scar

Fig. 13
X3 Siliqua patula nuttallii Conrad, 1837

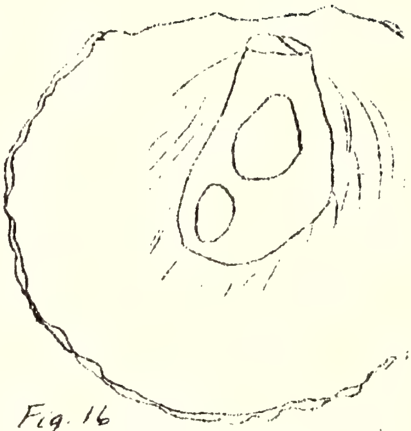


Fig. 16
X1 Podoesmus
macroschisma Desi'
1839

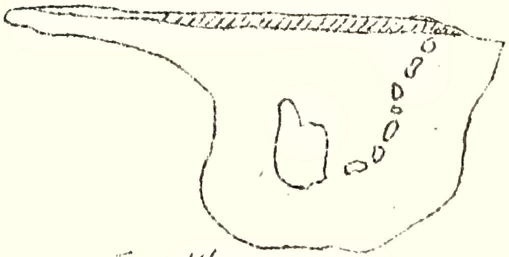


Fig. 14 Pteria
(after Keen)

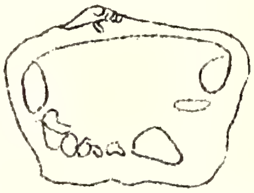


Fig. 17 Panomya
(after Keen)

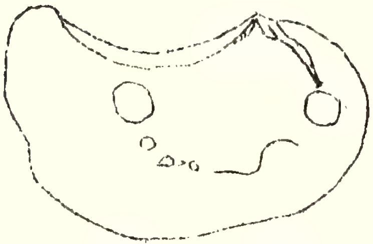


Fig. 15 Pandora
(after Keen)

PLATE VII

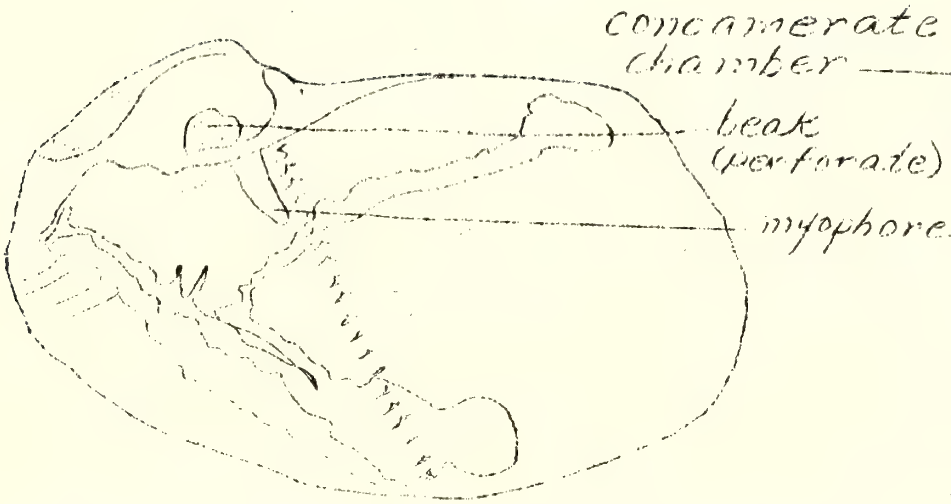

concamerate chamber
beak (perforate)
myophore

Fig. 18 Pholadidea ovoidea (Gould) 1851 x1 interior view

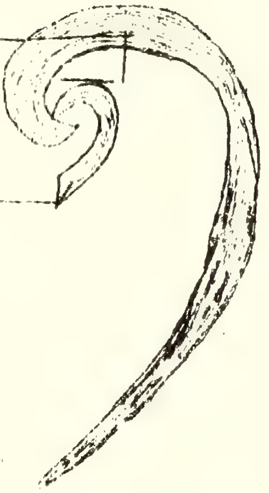


Fig. 19 Pholad (after Keen)

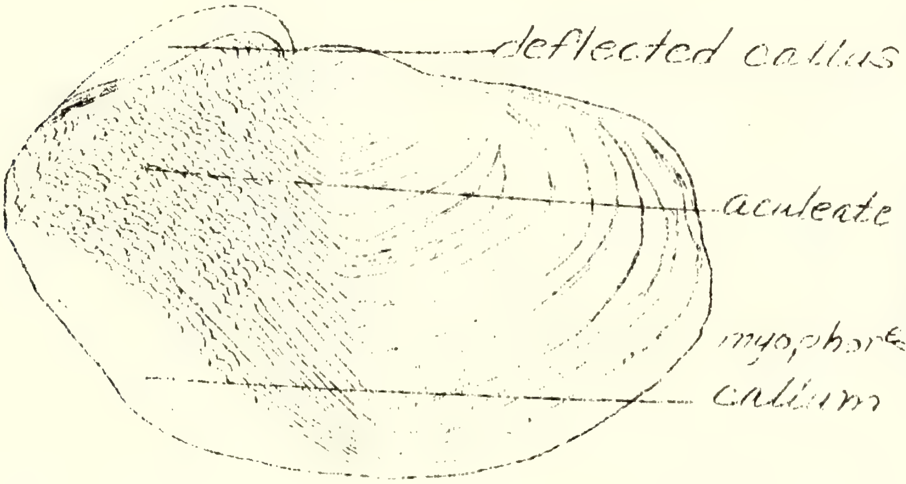

deflected callus
aculeate
myophore
callum

Fig 20 Pholadidea ovoidea (Gould) 1851 lateral view

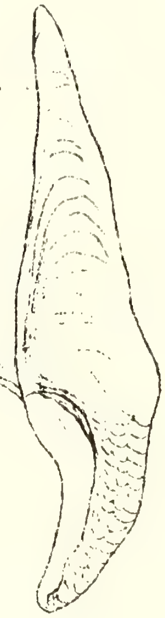


Fig. 21 dorsal view

PLATE VIII

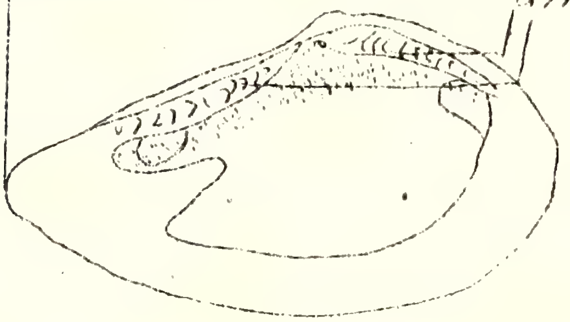

acuminate ends
amphidetic ligament

Fig. 22 Nuculana oxia
Dall, 1916 X10

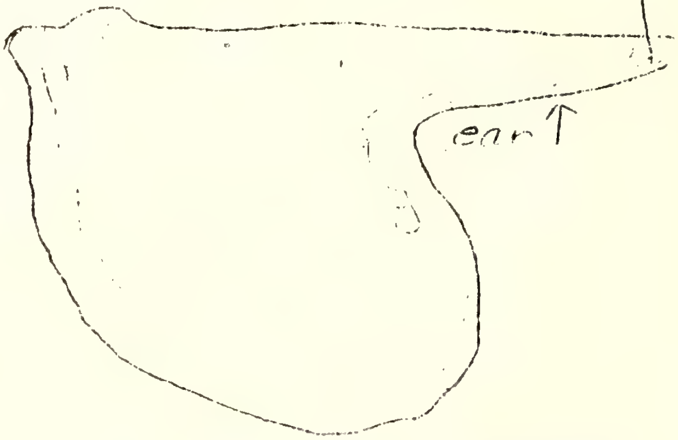


Fig. 23 Pteria sterna
Gould, 1851 (X2)
(Juvenile)

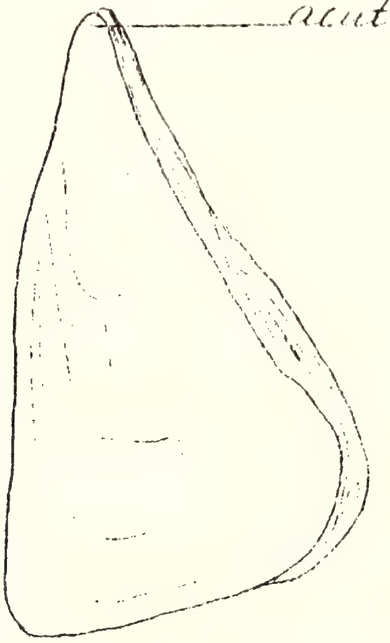

acute umbone

Fig. 24 Atrina oldroydii
Dall, 1901 X 1/3

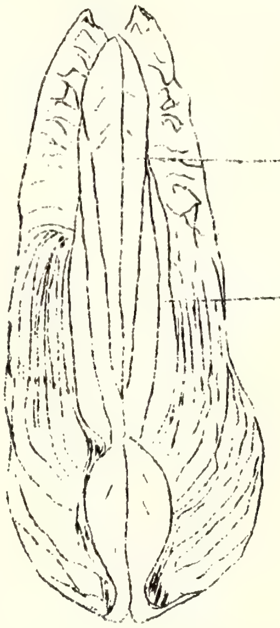

mesoplax
metaplax

Fig. 25 Parapholas
californica
Dorsal View X1

PLATE IX

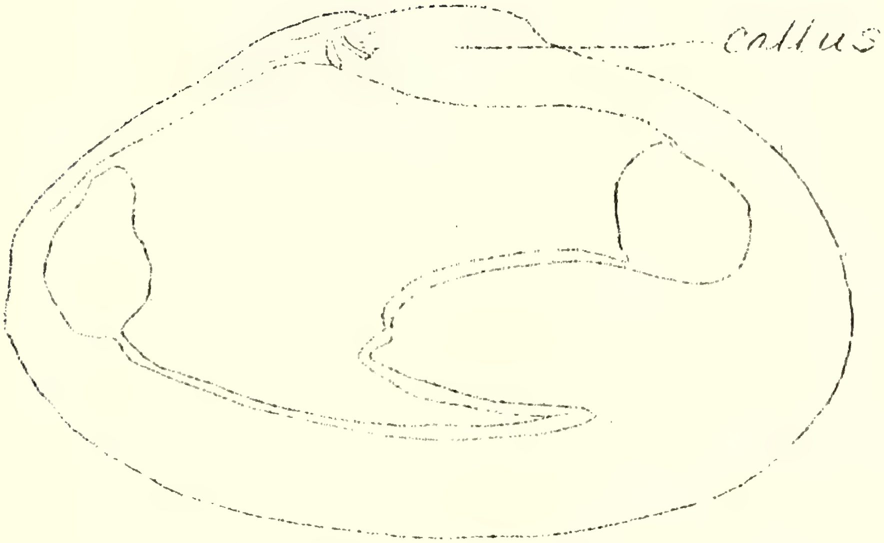


Fig. 26 Gari californica (Conrad) 1848 ×1

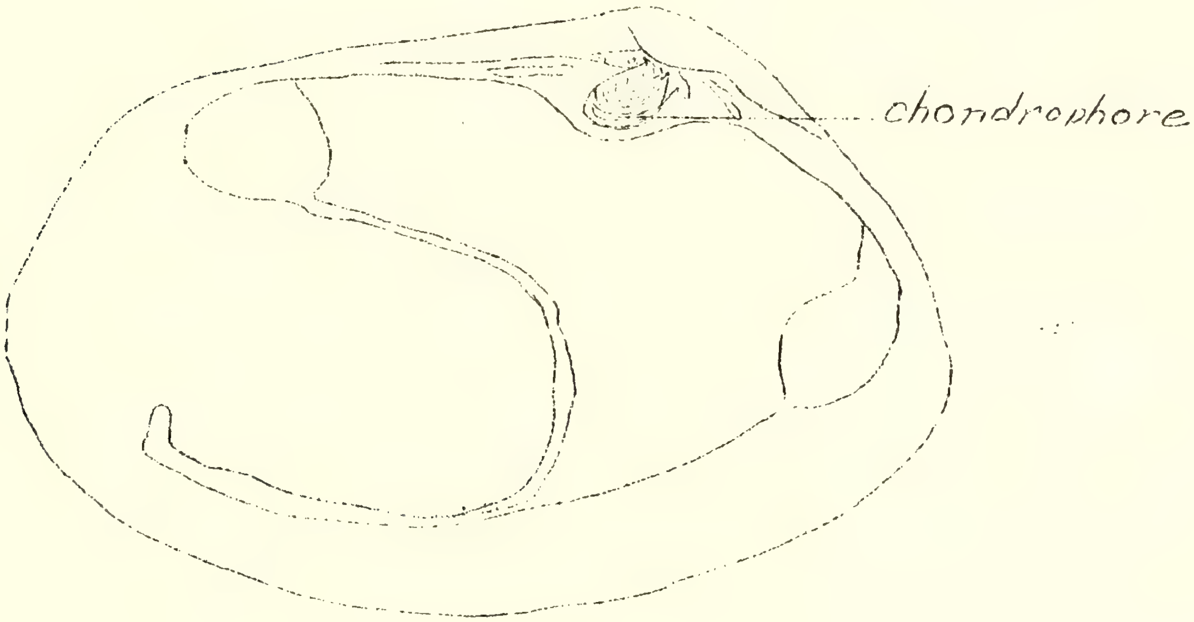

chondrophore

Fig. 27 Schizothaerus nuttallii (Conrad) 1837 ×1

PLATE X

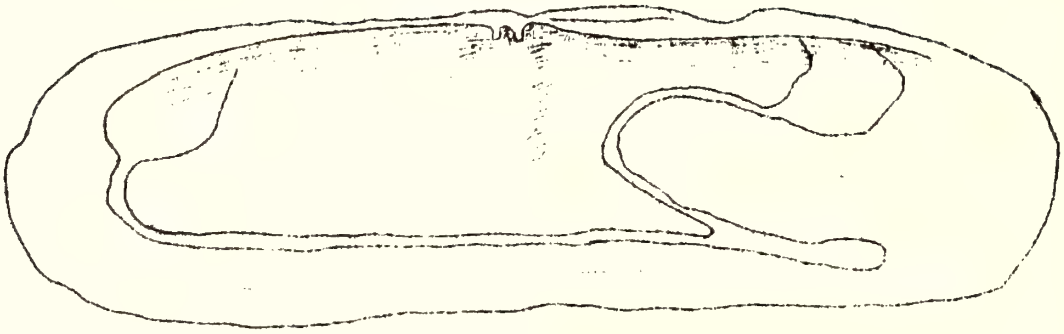


Fig. 28 Tagelus subteres (Conrad) 1837
X 3 THB

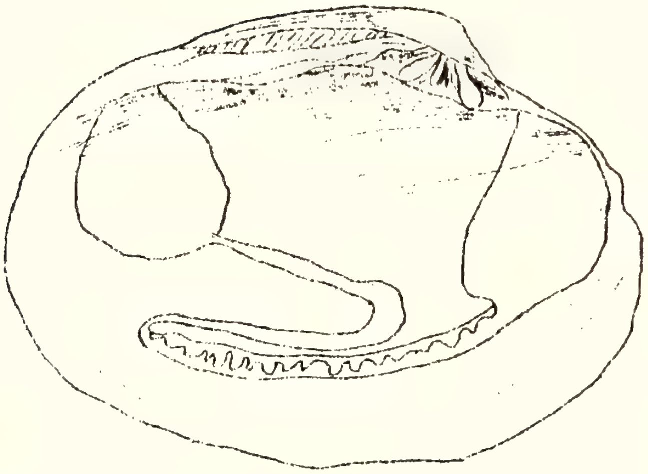


Fig. 29 Saxidomus nuttallii Conrad. 1837 X1

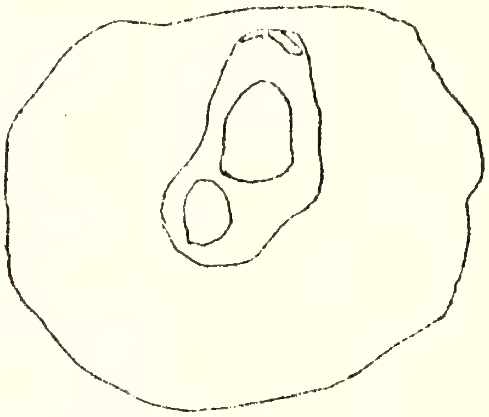
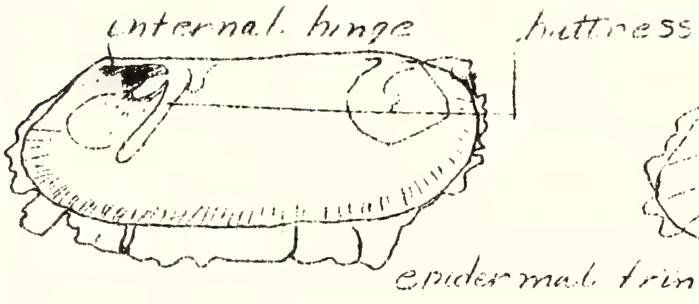


Fig 30 Pododesmus macroschismus (Deshayes) 1839 X1


internal hinge
buttress
epidermal fringe

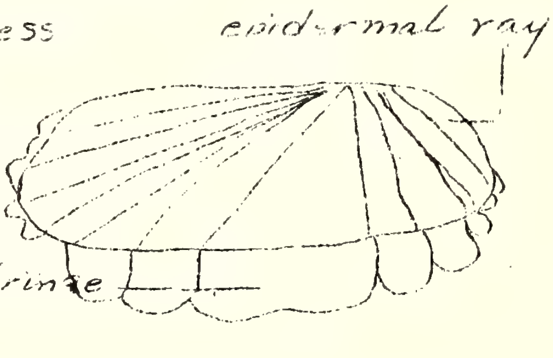

epidermal ray

Fig. 31 Fig. 32
Solemya australis Lamarck X1¼

PLATE XI

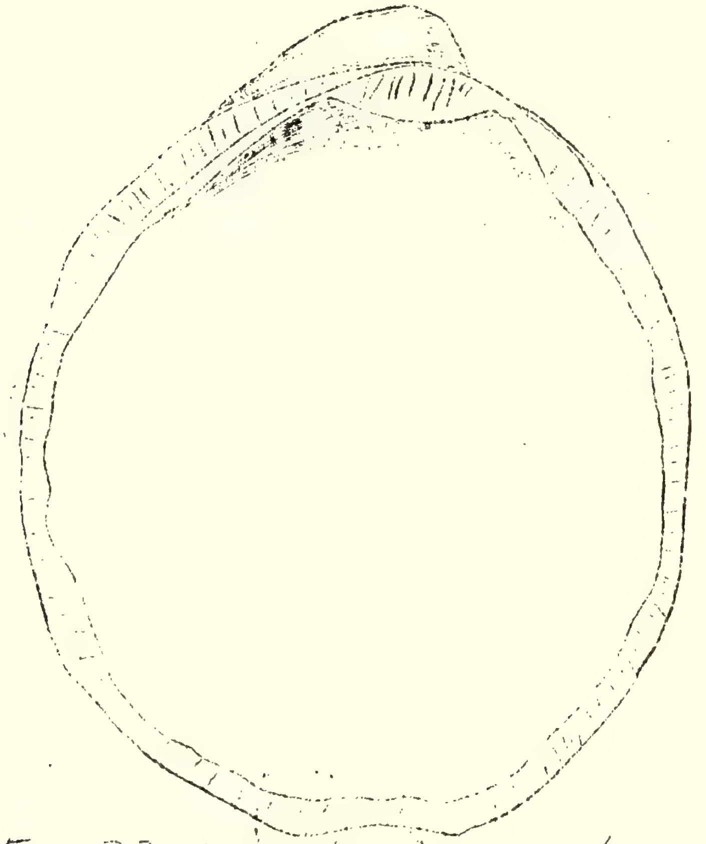


Fig. 33 Crenella divaricata
d'Orbigny 1845 x32

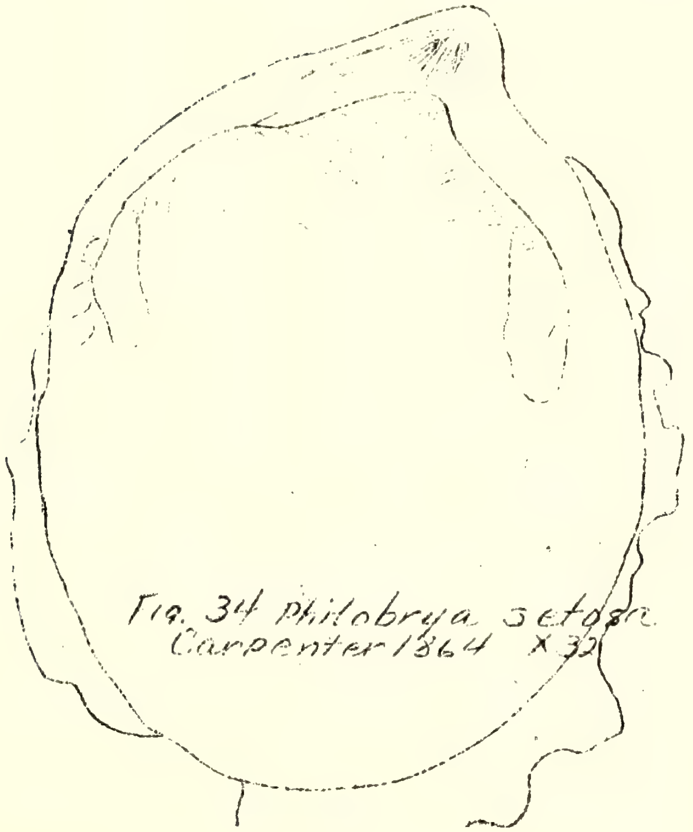


Fig. 34 Philobrya setosa
Carpenter 1864 x32

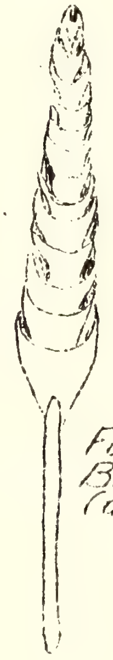


Fig 35 pallatte
Bankia gouldi
(after Thiele)

PLATE XII

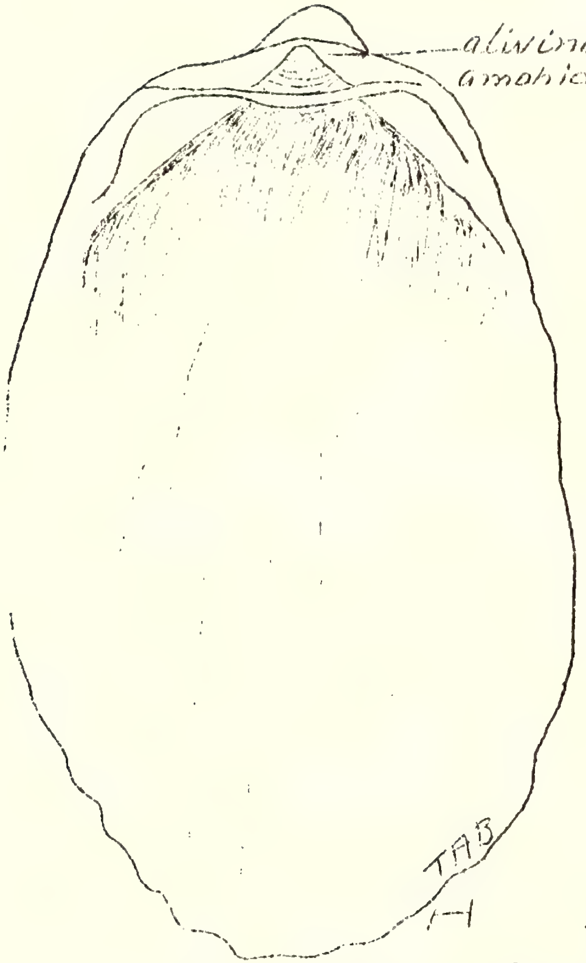

alivincular hinge
amphidetic ligament
TAB
H

Fig. 36 Lima subauriculata Montagu 1803

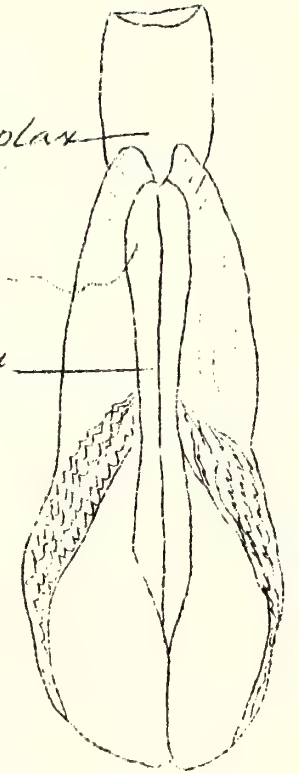

siphonoplax
hypoplax

Fig. 37 Parapholas californica
Ventral view X1

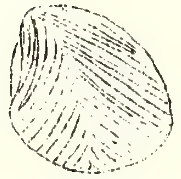


Fig. 38 Acila lyalli
X 1½

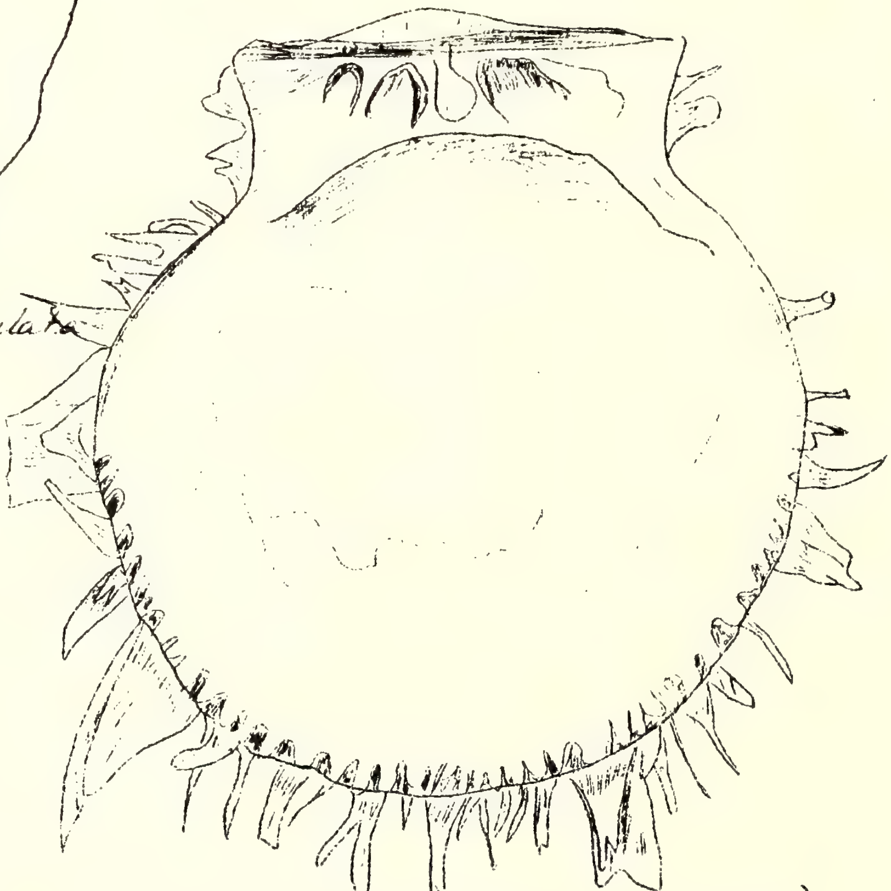


Fig. 37 Spondylus macroschismus?
X1

PLATE XIII

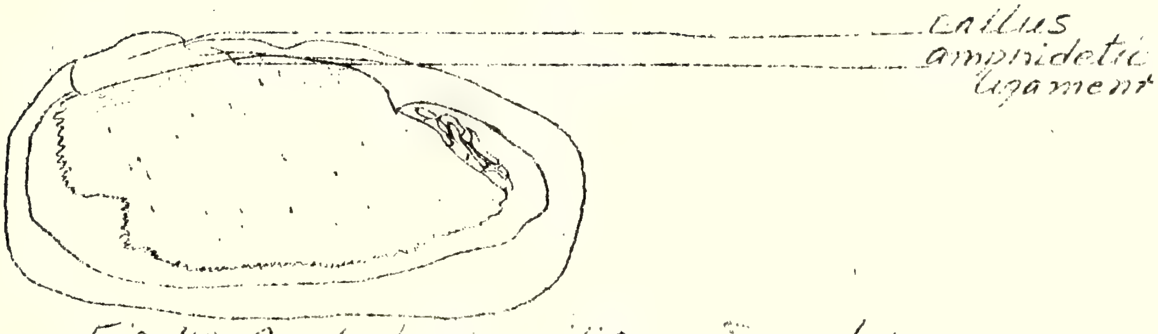

callus
amphidetic
ligament

Fig. 40 Cyrtodaria siliqua Spengler

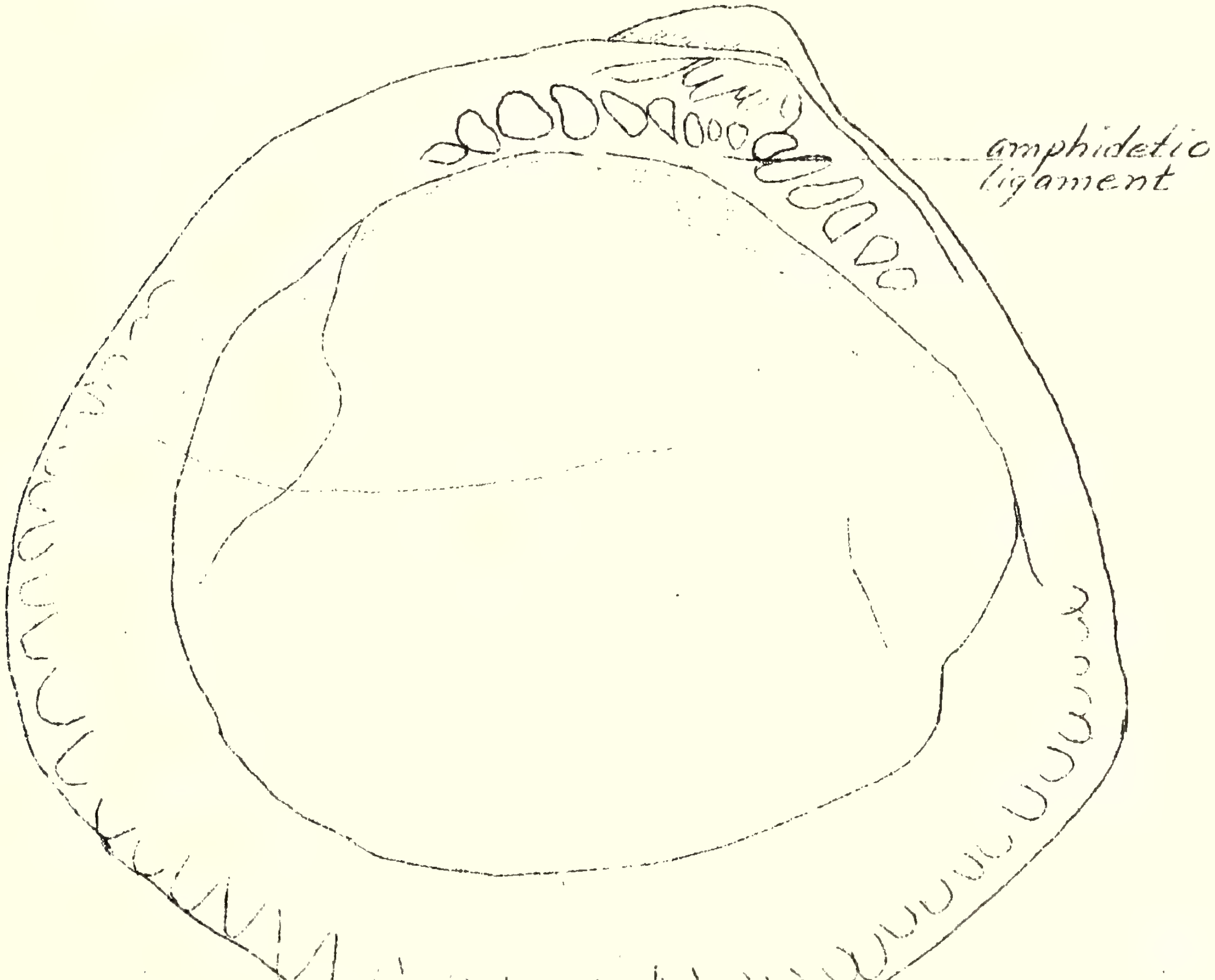

amphidetic
ligament

Fig. 41 Glycymeris subobsoleta
Carpenter 1864 x10

PLATE XIV

Anolamodesmacea

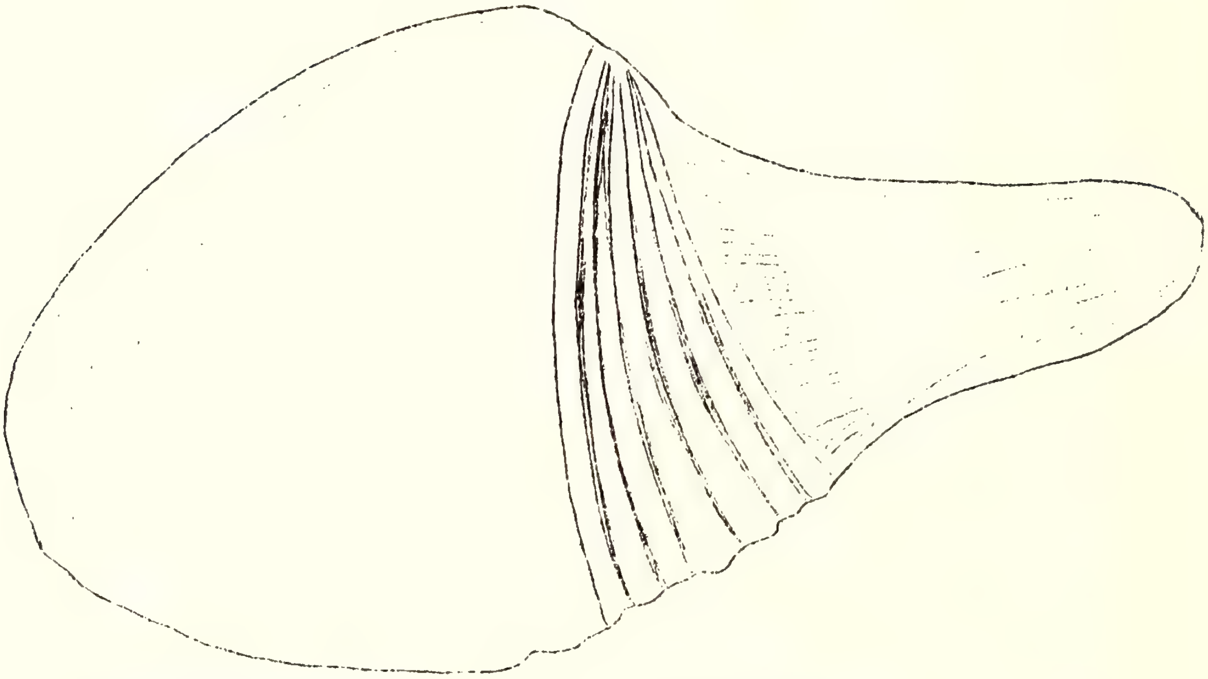


Fig. 42a Cuspidaria planetica Dall, 1908 ×10

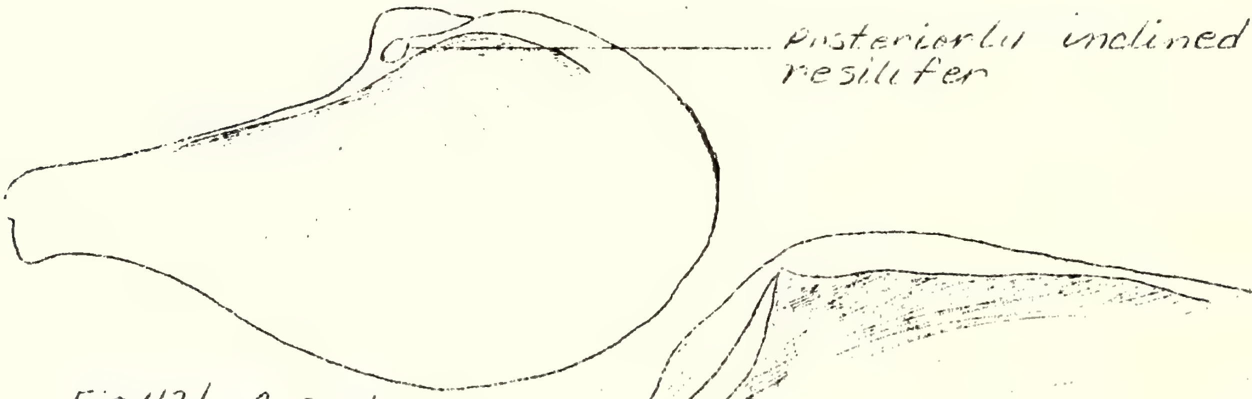

Posteriorly inclined resilifer

Fig. 42b Cuspidaria planetica Dall, 1908 ×10

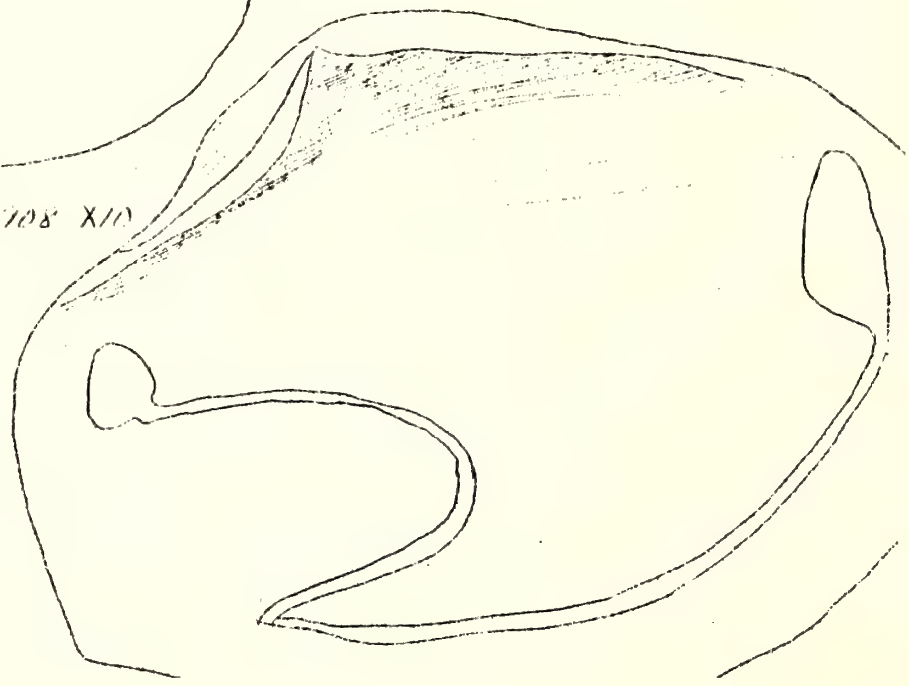


Fig. 43 Thracia trapezoides Conrad 1847 ×10

—7

PLATE XV

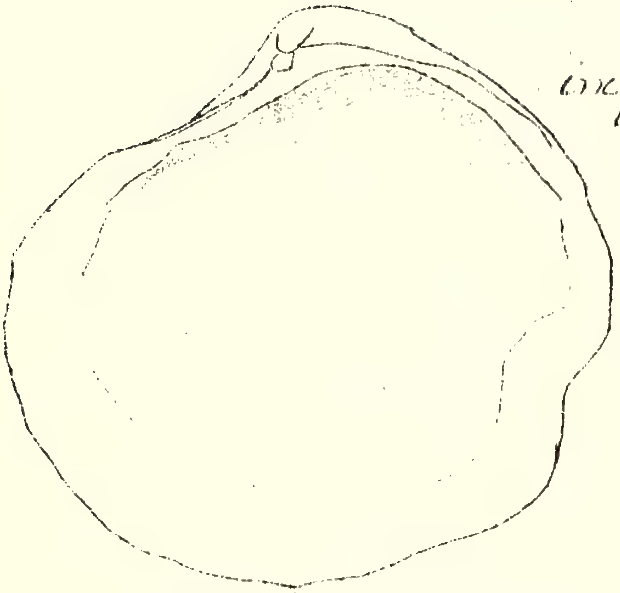


Fig. 44a right valve
interior

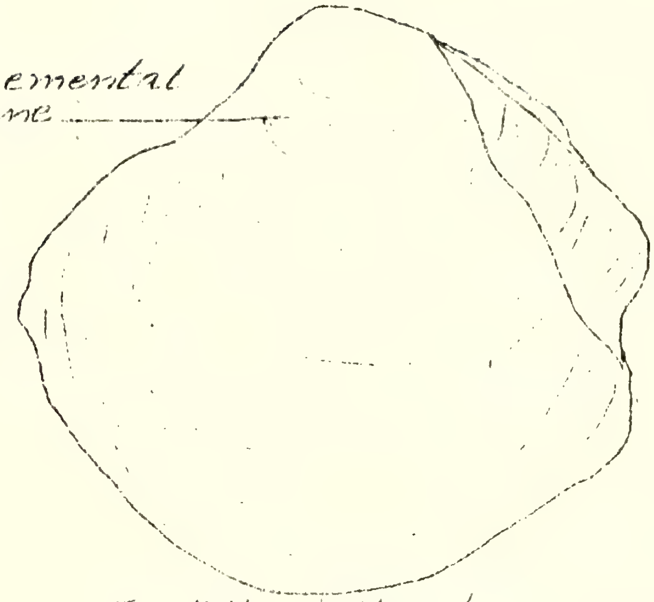

incremental
line

Fig. 44b left valve
exterior

Thracia gouldii Philippi 1845 ×10

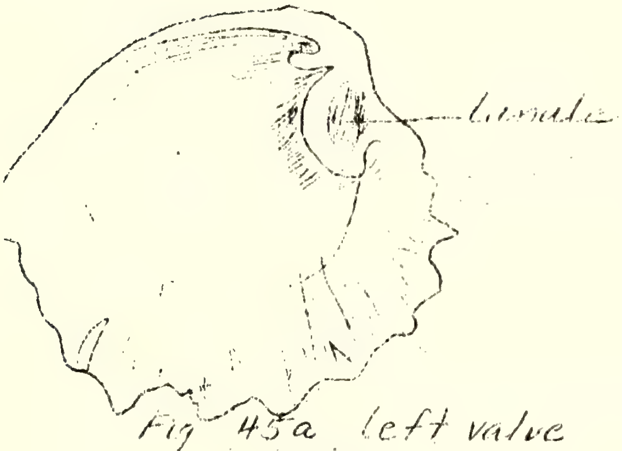


Fig 45a left valve
interior

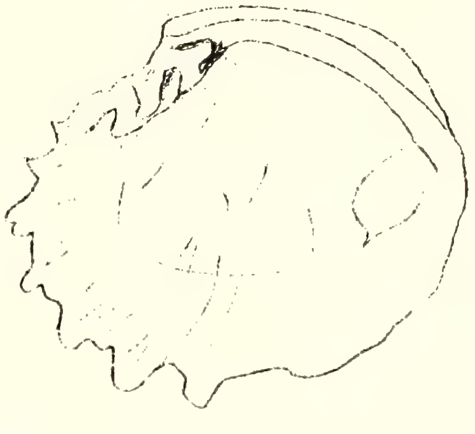


Fig. 45b right valve
exterior

Verticordia ornata d'Orbigny 1846 ×10

PLATE XVI

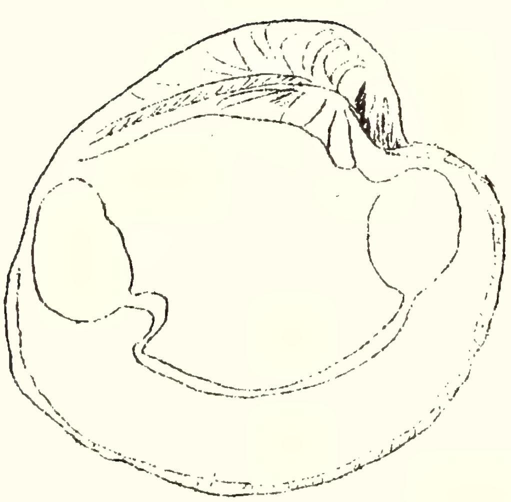


Fig. 46 Antigona fordi
Yates, 1890 X1

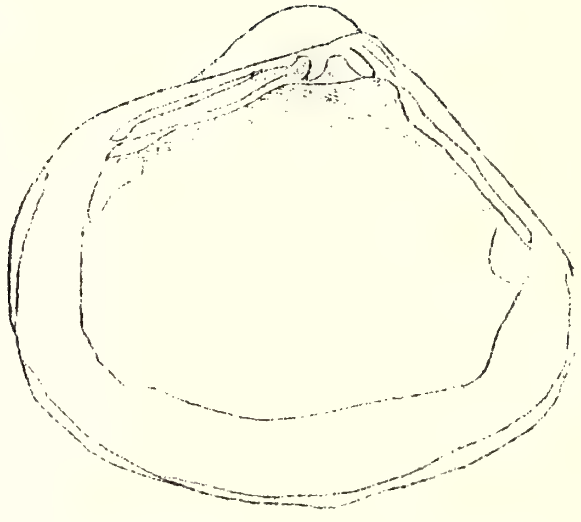


Fig. 47 Corbicula fluminea
Muller X1½

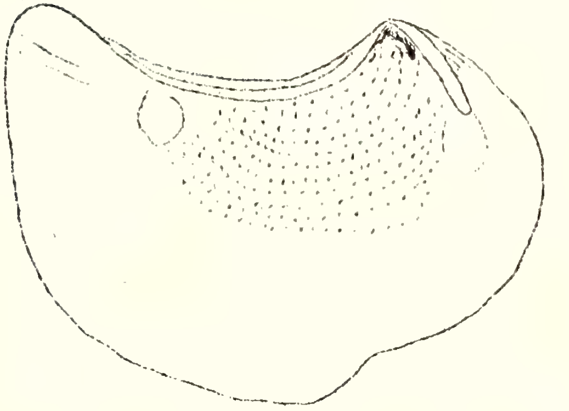


Fig. 48 Pandora punctata
Conrad, 1837 X2

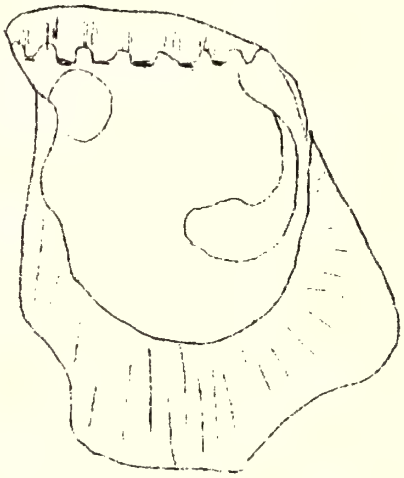


Fig 49 Perna chemnitz-
ianum d'Orbigny X2

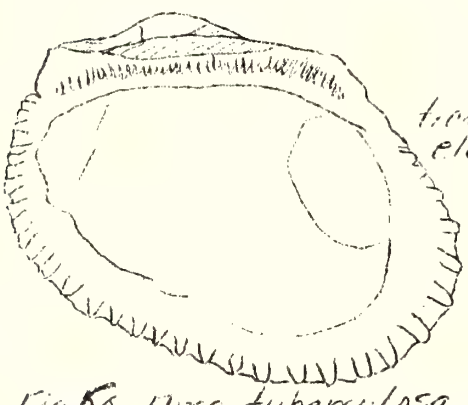
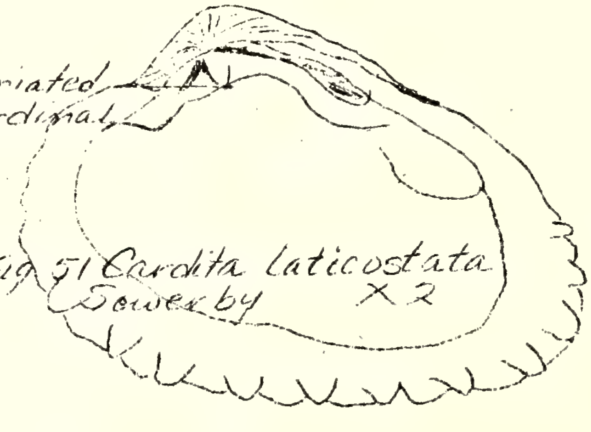


Fig. 50 Arca tuberculosa Say X1



transversely striated
elongated cardinal

Fig. 51 Cardita laticostata
Sowerby X2

PLATE XVII

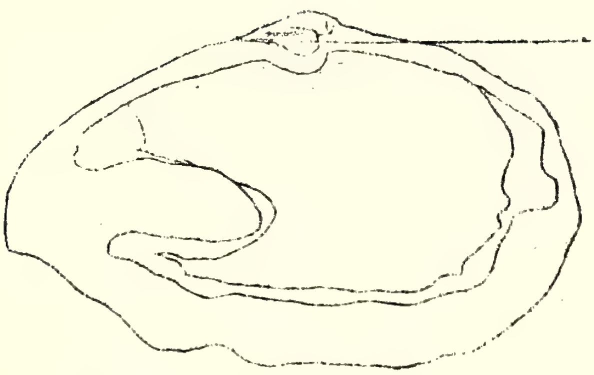

chondrophore

Fig. 52a interior

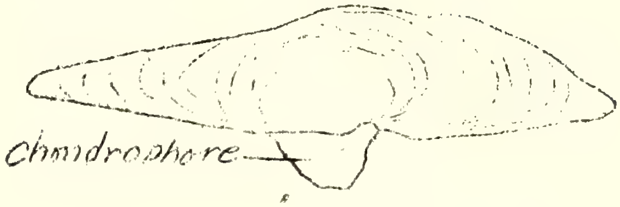

chondrophore

Fig. 52b dorsal view

Mya arenaria Linnaeus 1758 ×1

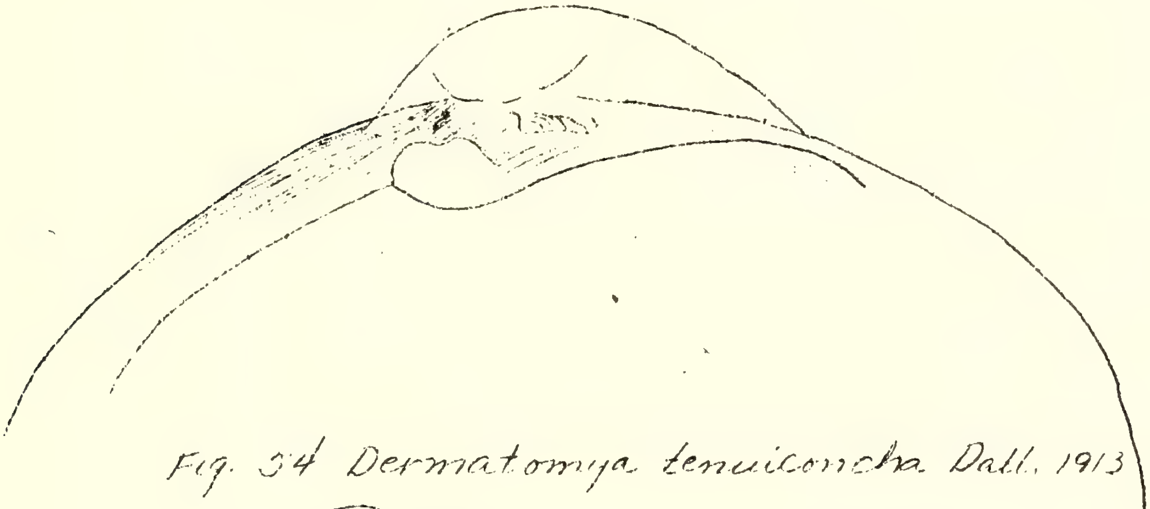


Fig. 54 Dermatomya tenuiconcha Dall. 1913 × 10

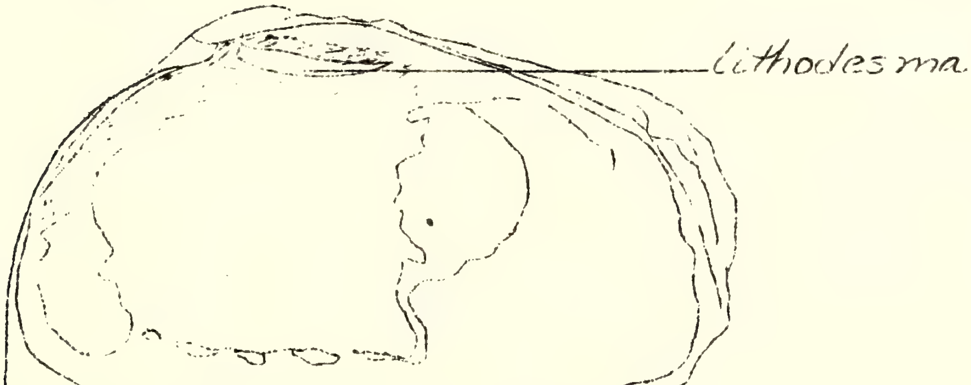

lithodesma

Fig. 53 Entodesma saxicola Baird ×1

PLATE XVIII.

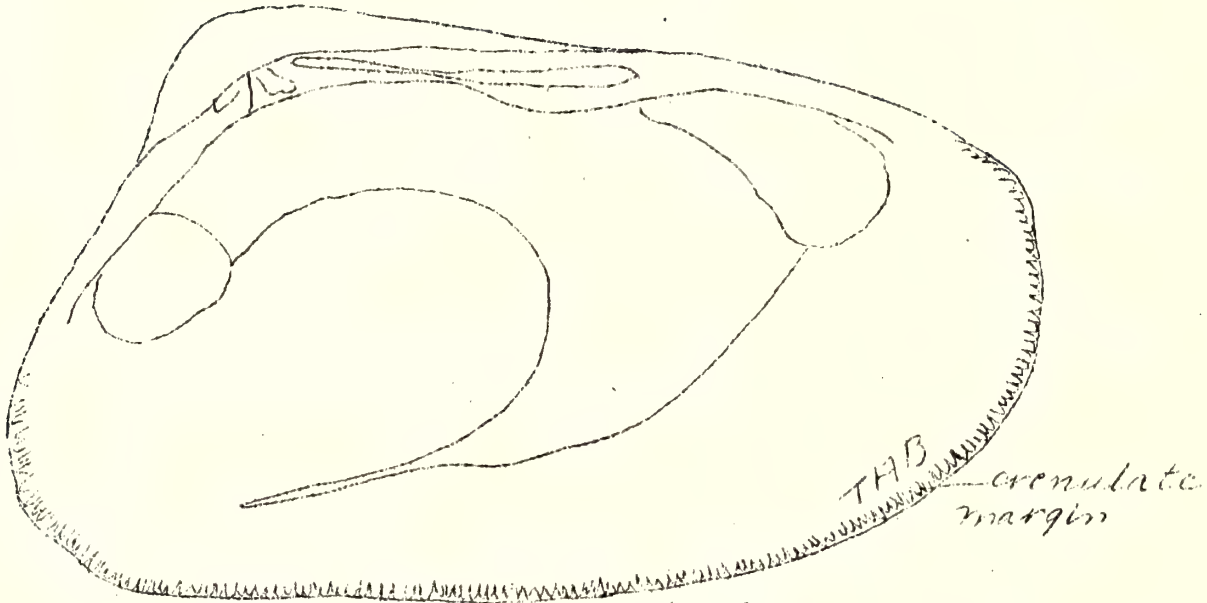

THB
crenulate margin

Fig. 55 Donax gouldi Dall, 1919 X5

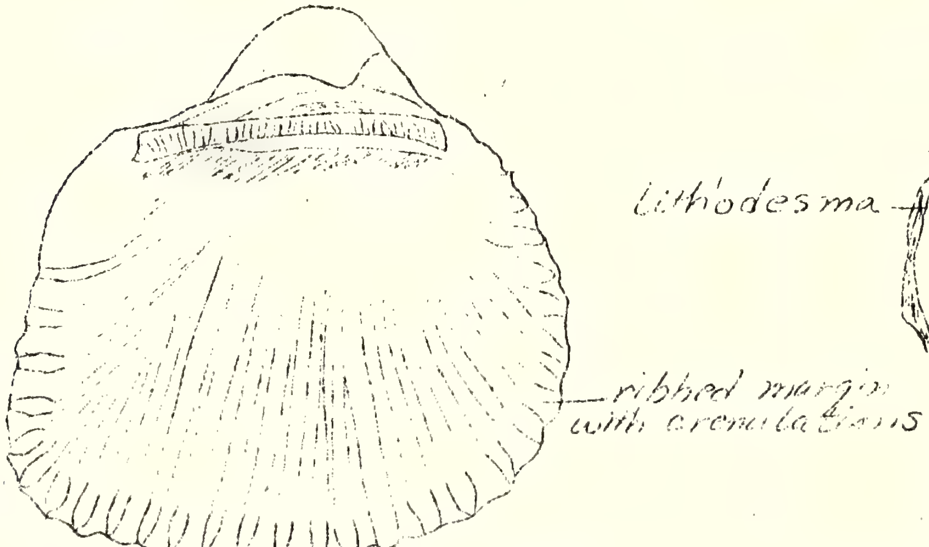

ribbed margin with crenulations

Fig. 56 Arca multicostata Sowerby 1833 X1

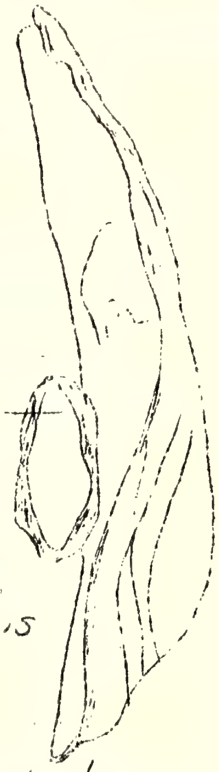

lithodesma

Fig. 57 Entodesma ventral view X1

PLATE XIX

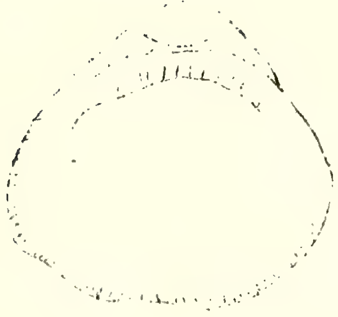


Fig. 58 Glycymeris profunda Dall, 1877 ×1.7

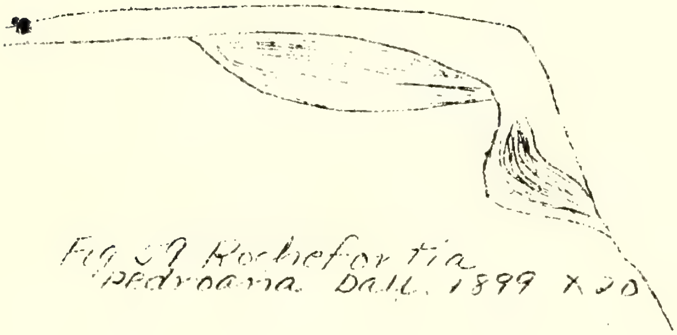


Fig. 59 Rochefortia pedroana Dall. 1899 ×20

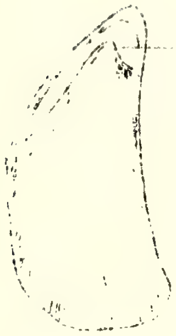

umbonal deck

Fig. 60 Septifer bifurcatus Reeve ×1

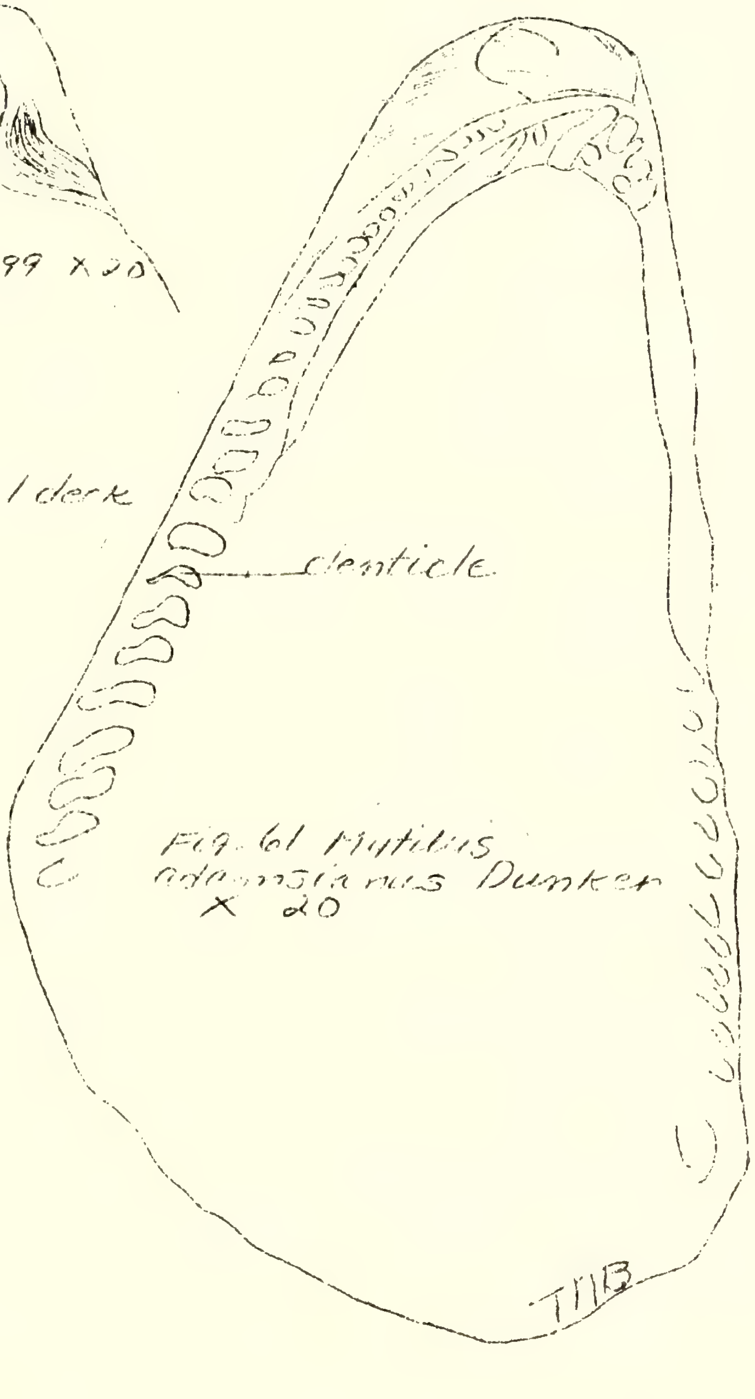
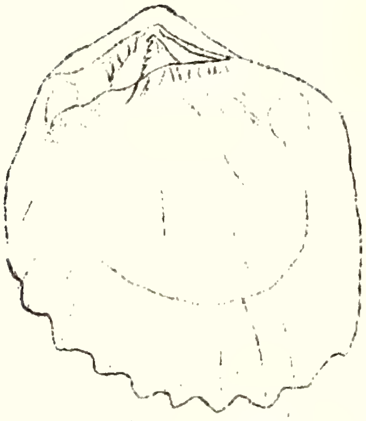

denticle
TMB

Fig. 61 Mytilus adamsianus Dunker × 20

PLATE XX



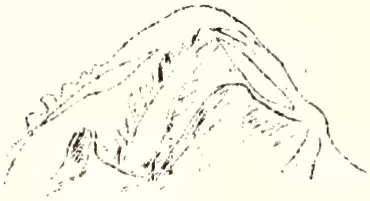
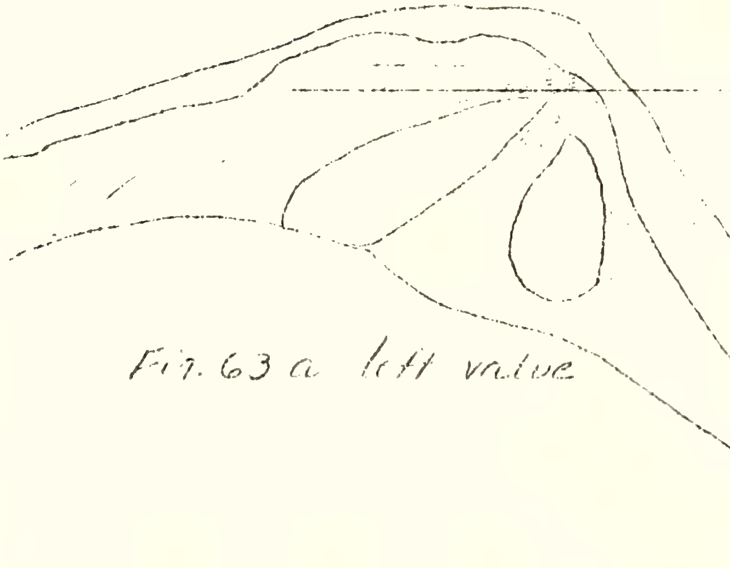


Fig. 62b enlarged tooth showing striations on sides of teeth

Fig. 62a Neotrigona strangei Adams X2
Australia



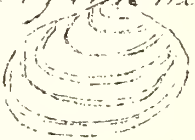


Fig. 63b X1

Fig. 63a left valve

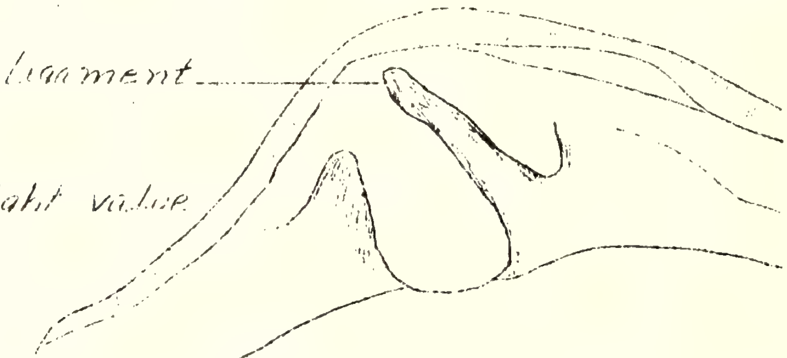


Fig. 63c right valve

Astarte alaskensis Dall. 1903 X10

PLATE XXI

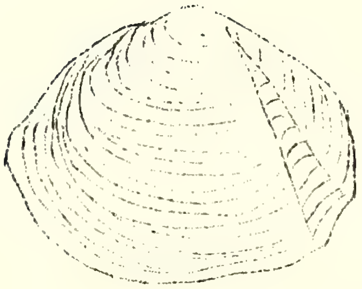


Fig. 65 Apolimetis biangulata (Carp.) 1856 X1

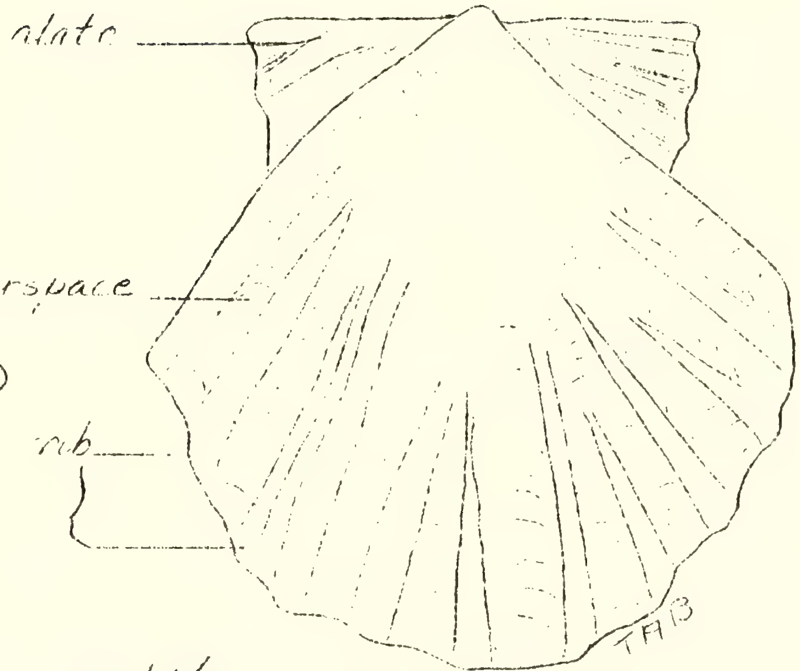

alato
interspace
rib
TAB

Fig. 64 Pecten alaskensis Dall. 1871

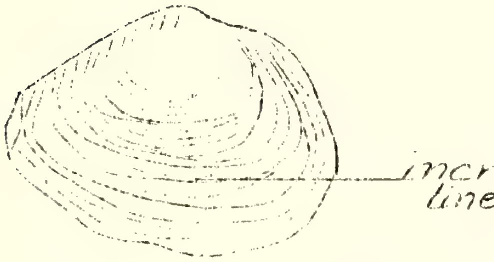

incremental line

Fig. 66 Macoma nasuta. (Conrad) 1837

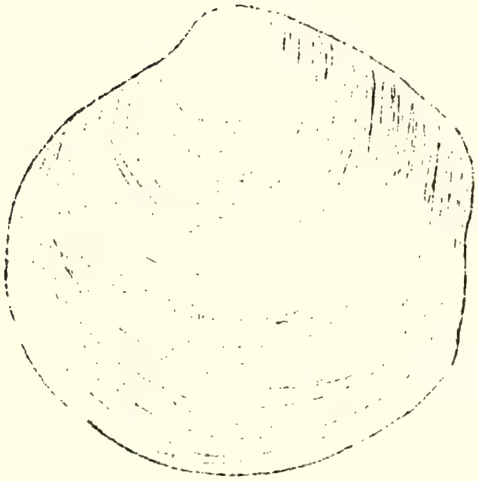


Fig. 67a exterior

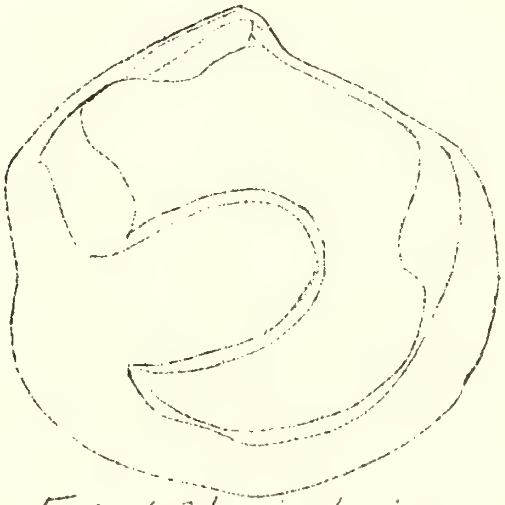


Fig. 67b interior

Semele decisa (Carpenter) 1837 X1

PLATE XXII

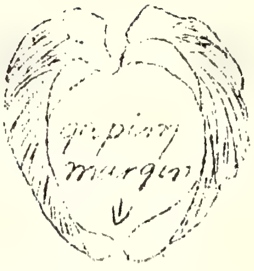

gaping margin

Fig. 68 Parapholas californica (Conrad) 1837

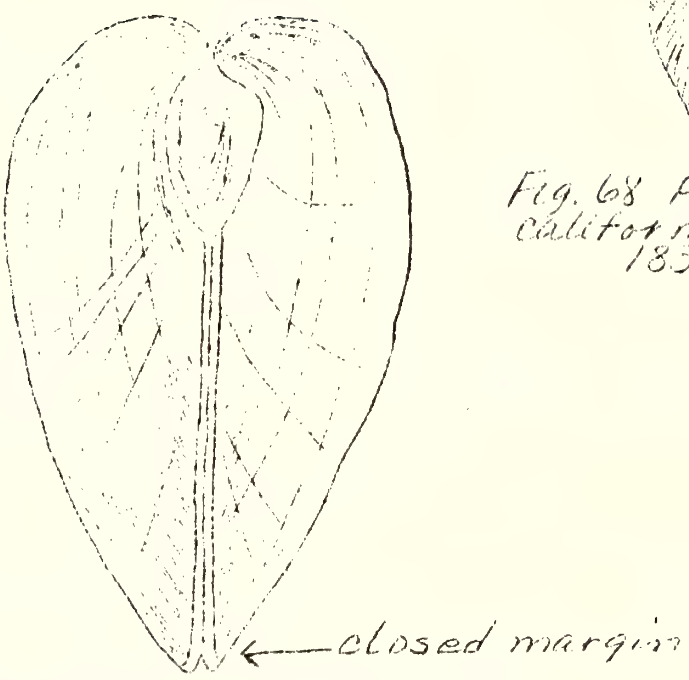

closed margin

Fig. 69 Tivela stultorum (Mawe) 1823

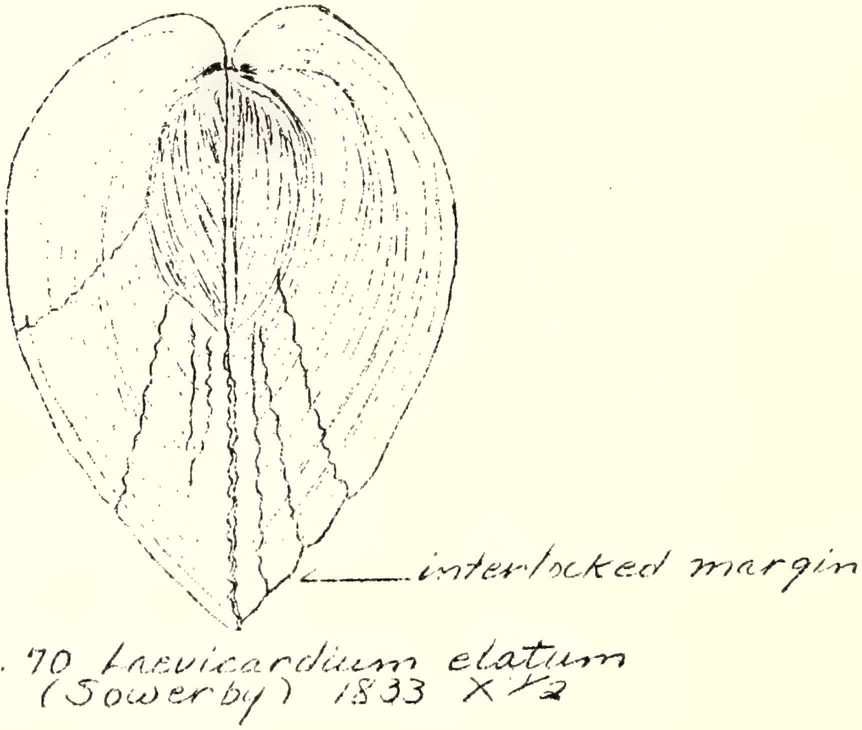

interlocked margin

Fig. 70 Laevicardium elatum (Sowerby) 1833 X 1/2

PLATE XXIII

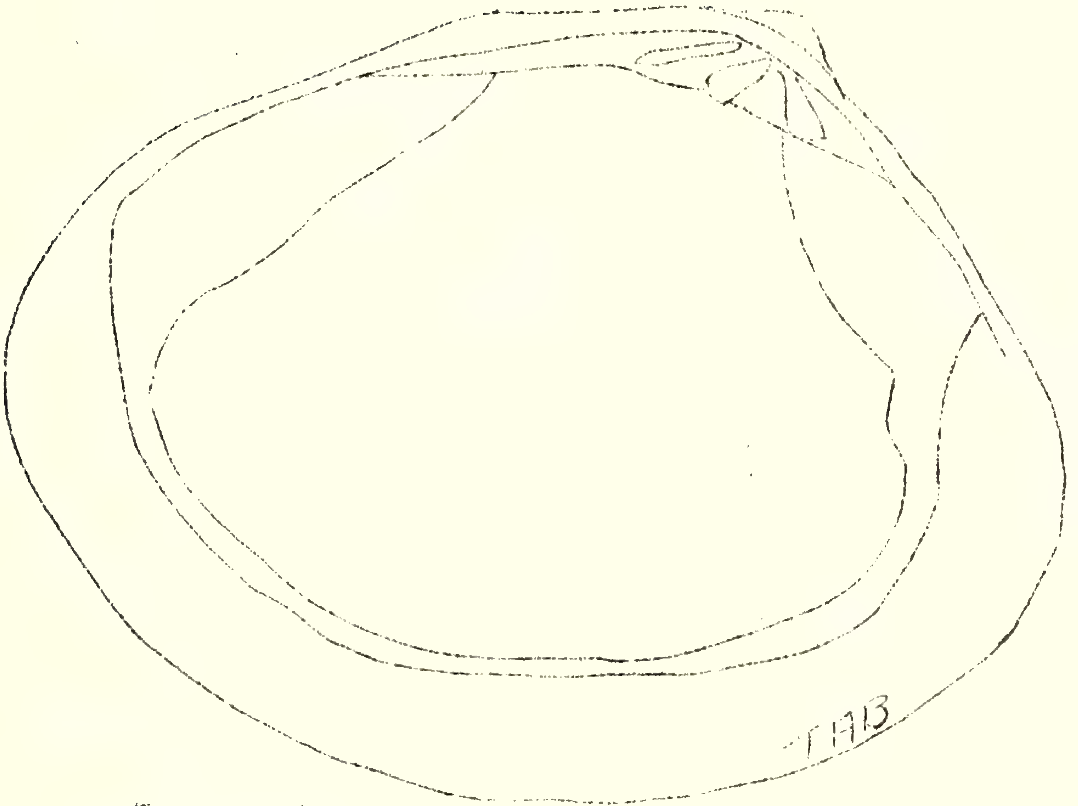


Fig. 71 Psephidea ovalis Dall, 1902 X28

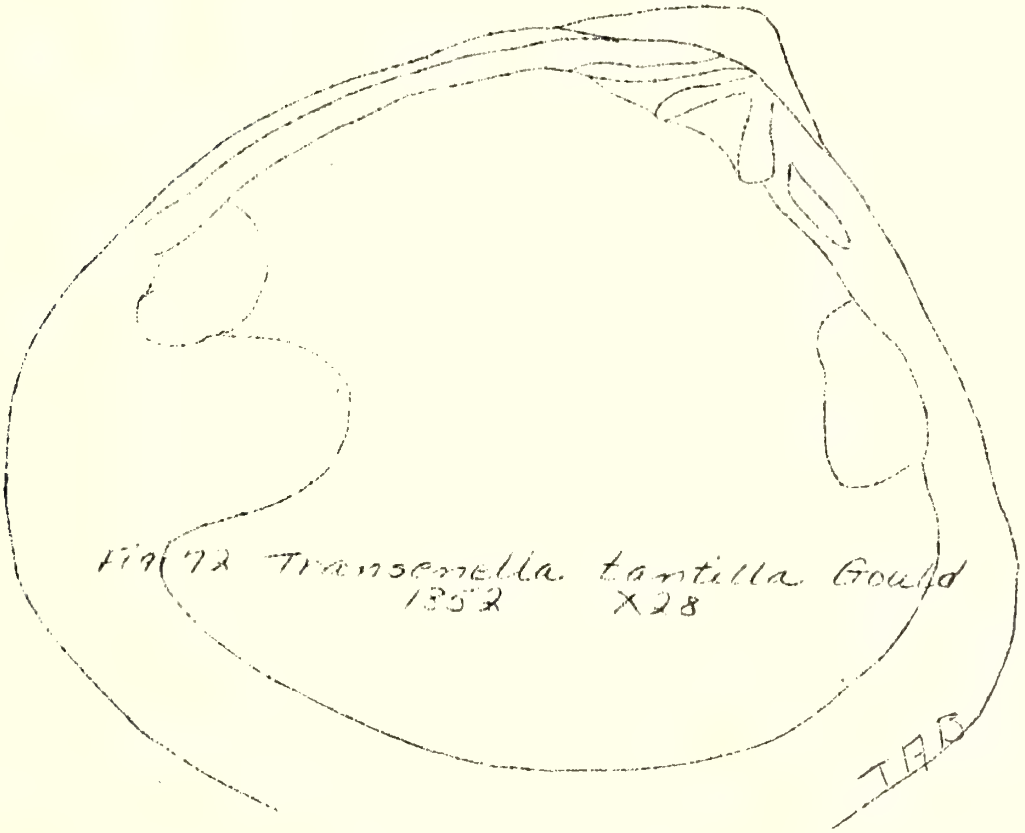


Fig 72 Transenella tantilla Gould
1852 X28

PLATE XXIV

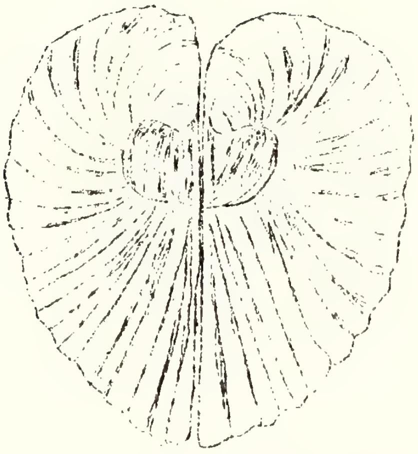


Fig. 73 Antigona fordi Yates, 1870 X1

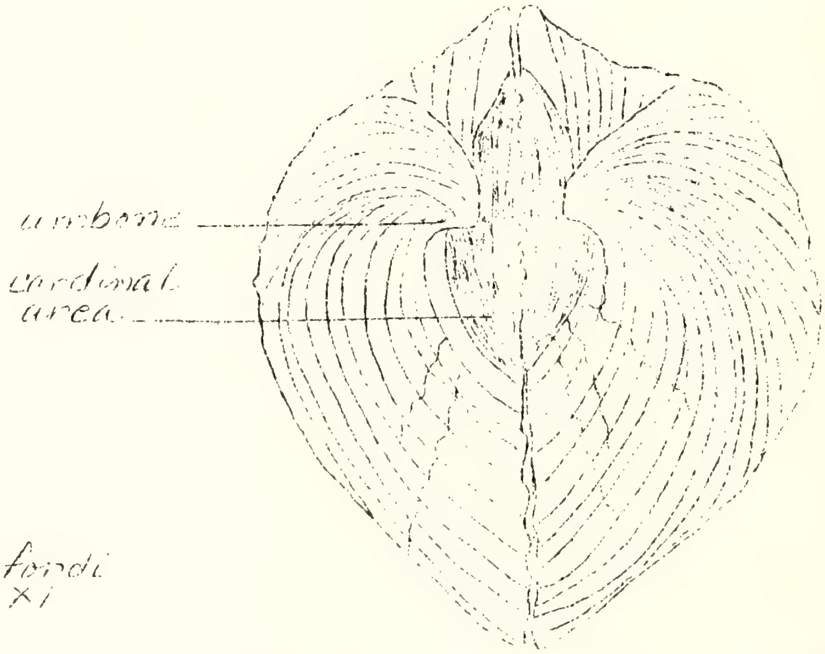

umbone
cardinal area

Fig. 74 Arca multicostata Sowerby 1833 X1

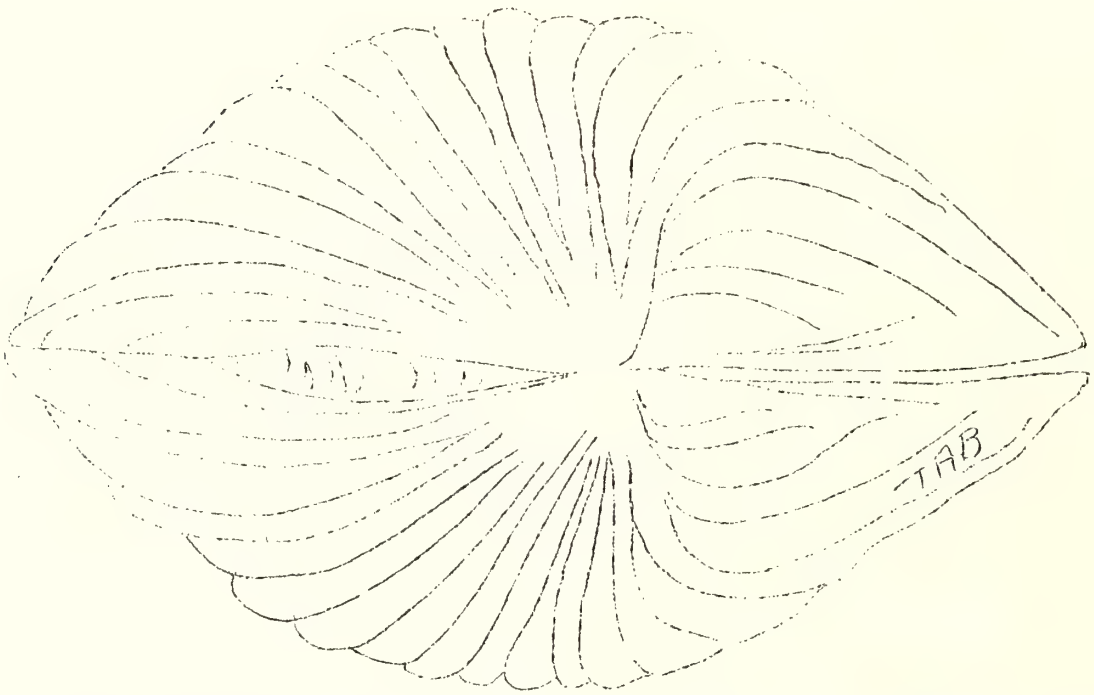


Fig. 75 Cardita ventricosa Gould, 1850 X10

PLATE XXV

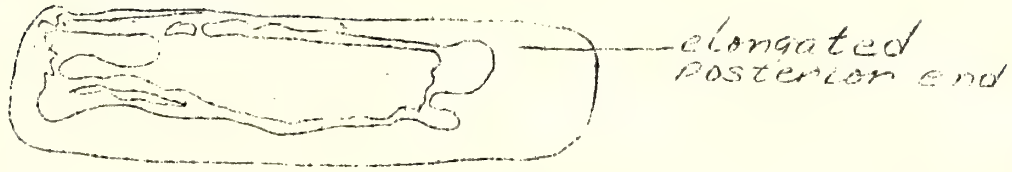

elongated
posterior end

Fig. 76 Solen sicarius Gould

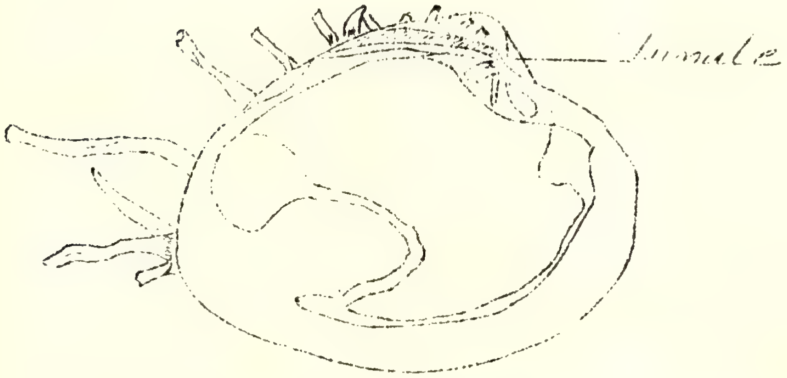


Fig. 77a Pitar lupinaria Lesson
left value interior

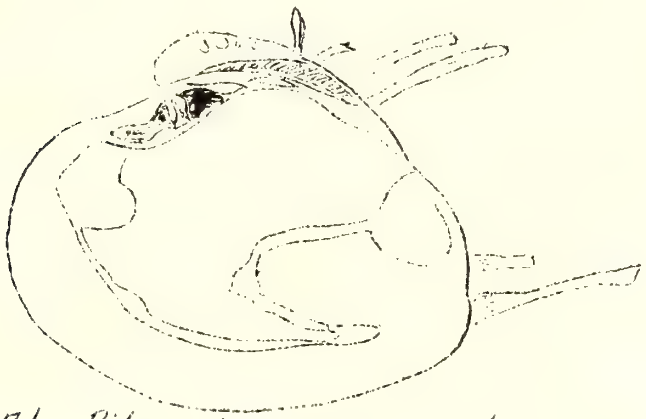


Fig. 77b Pitar lupinaria lesson
right value interior

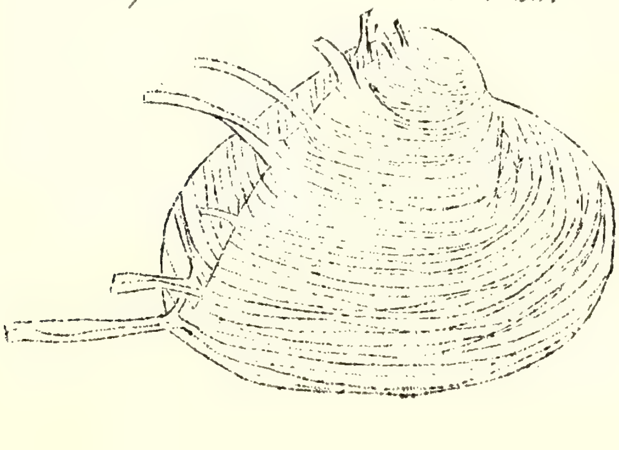


Fig. 78 Pitar lupinaria
Lesson exterior

PLATE XXVI

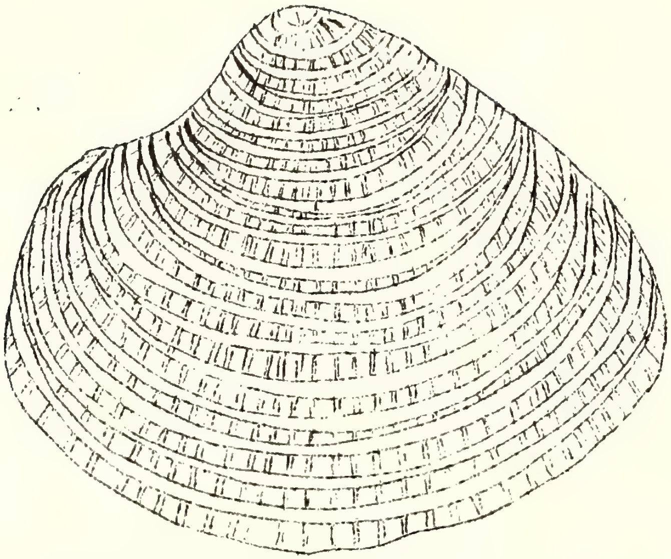


Fig. 80 Protothaca undatella (Sowerby) 1835 X 2

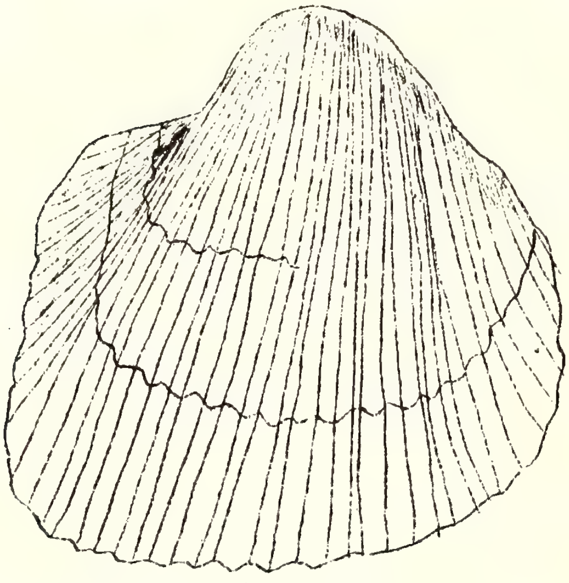


Fig. 81 Arca multicostata Sowerby 1833 X1

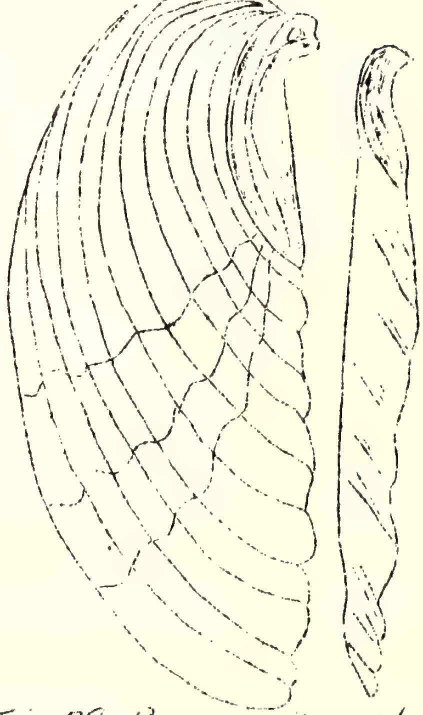
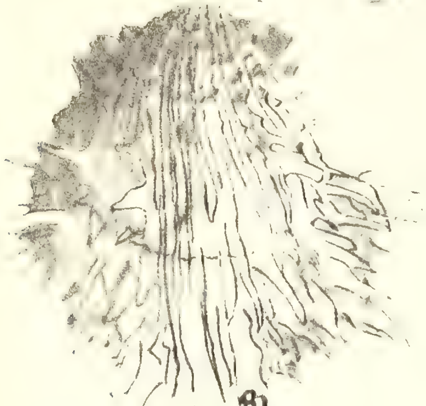


Fig. 79 Pecten purpuratus Reeve

Plate XXVII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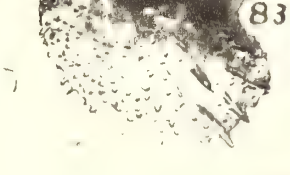
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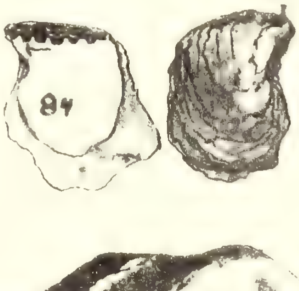
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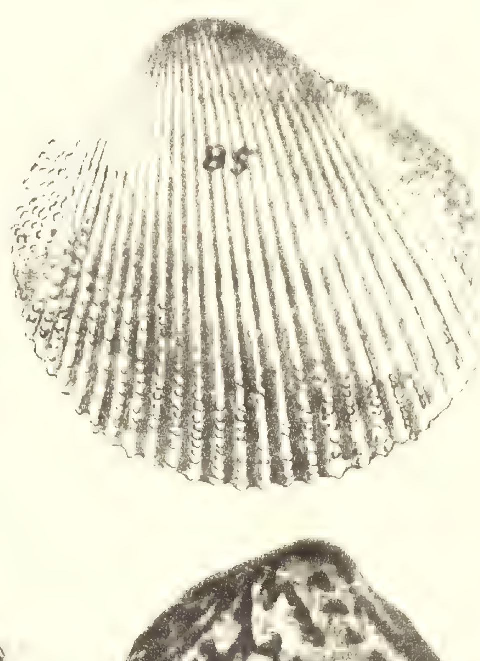
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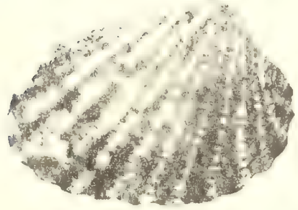

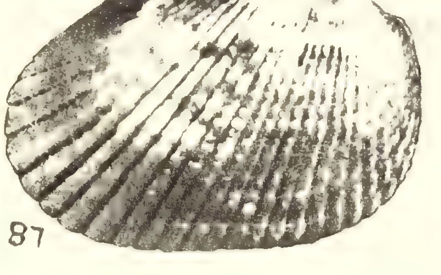
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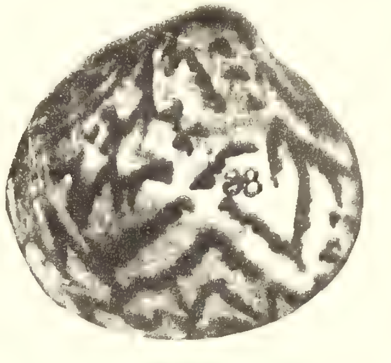
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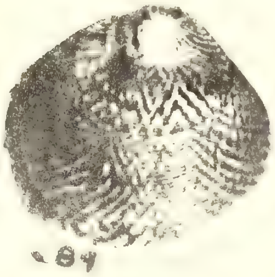
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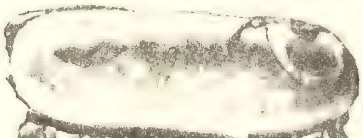
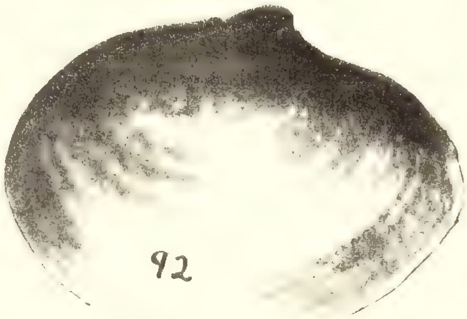


fig 90

9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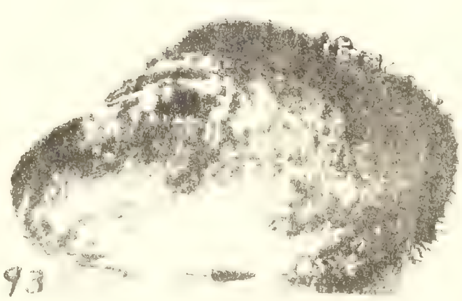
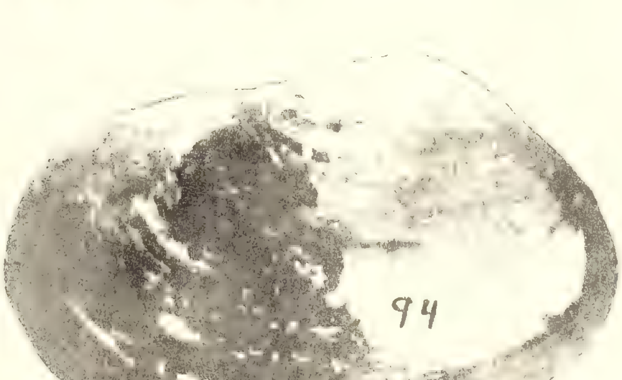

93


94

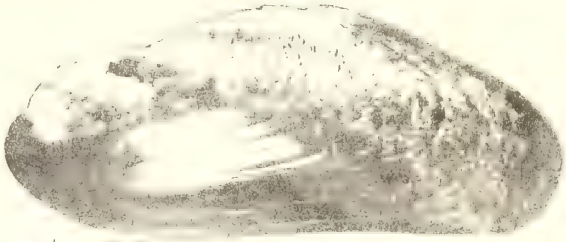
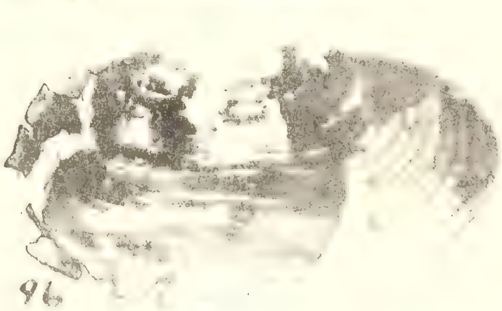


fig. 95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Haliotidae
Fissurellidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
May 1946

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NOTES ON LIVING CALIFORNIA CREPIDULAS
by Allyn G. Smith

The white *Crepidulas* of the subgenus *Ianacus* Morch,1852, of the *West Coast of North America* have been a problem for conchologists at least since Broderip's time, judging by the number of names given to them. They are found in all sorts of locations, giving rise to many situs forms. The existing problem is first to consider what names are available, and then apply these to the appropriate species under the rules of nomenclature.

Probably no two conchologists today would agree on a settlement of these two problems, so it is with some hesitation that the following discussion and opinions are offered in the hope that they may lead to a consensus on what the answers should be.

Crepidula nummaria Gould,1846.

This is a fine, large, distinct species, easily identified by the thick, golden-brown periostracum, which normally covers the shell although in old specimens it may have been worn off to some extent. The type locality is the Strait of Juan de Fuca and it has been found fairly commonly on the coasts of San Luis Obispo, Sonoma, and Mendocino counties . It has not been reported from Monterey, apparently skipping that region. There are lots in the collection of the California Academy, which are apparently this species from Tepoca Bay, Lower California; from Freshwater Bay, Tiburon Island in the Gulf; and from Magdalena Bay. Whether the range extends as far south as Mazatlan appears open to question and needs confirmation, as the species seems to flourish in colder waters. Under favorable conditions on the California coast *nummaria* grows a circular shell, as refigured by Oldroyd in her plate 91, figures 14,14a, and 14b. This shape is not the usual one, however, as subtriangular and subquadrate shapes are more often found, expecially in older and larger specimens. *Nummaria* grows a thick heavy shell and is by all odds the largest of the northern California *Crepidulas*. Because of its periostracum its outer surface is usually fairly clean, without the incrustations of worm-tubes, barnacles, and bryozoans generally occuring on another species of *Crepidula* occasionally collected from the under side of the same rock inhabited by a colony of *nummaria*.

(con.)

***NOTE- This issue will serve for May and June- next issue July

The three lots from Lower California and the Gulf do not have quite as heavy a periostracum, which tends to be lighter in color than on shells from California. In addition, the southern shells have a groundwork sculpture of rather irregular, somewhat wavy, fine striations, which are absent on the California specimens, Whether these differences constitute specific subspecific, or lesser factors cannot be told for certain from the few lots now available and a final determination of this must await the collection of more material.

Johnson and Snook, in discussion nummaria (page 538) appear to refer to another species. Their figure 601 (page 537) looks like a form of C. nivea C.B. Adams, but side and back views would be needed to identify this shell with certainty.

There has been considerable confusion between nummaria, and Adam's nivea and other white species but the presence of the heavy and sometimes shaggy golden-brown periostracum of the former would appear to be an ample distinguishing feature.

Crepidula nivea C.B. Adams,1852.

The type locality is Panama; Oldroyd gives the range from Puget Sound to Panama. The species is omitted from Dall's Bull. 112 and Dr. Myra Keen's Check List places it in the synonymy of nummaria, which the writer believes is incorrect in view of the evidence now on hand. Mrs. Oldroyd gives two fairly good figures of what she identified as nivea (plate 93, figs. 7,9), the latter one of a shell partially suffused with brown that she cites as a " color form". These illustrations do not appear to be the true nivea, as the writer understands it, but of another white species, C. perforans Val. to be discussed later.

Examination of a number of lots of C. nivea , or forms of it, in the California Academy's collection leads to the conclusion that it is a recognizable species that varies in size and shape to a considerable degree. The form considered to be true nivea differs from the other white Crepidulas from northern California in the following respects: (1.) It has an extremely thin, papery, colorless or very light yellow periostracum, which, in old and worn specimens, may show only in traces, and then only at the margins. This is a feature not mentioned by Adams in his original description, which may be accounted for by Carpenter's observation (1872-37) that Adam's' " type specimens are small, poor, and rough, of the var. striolata , passing into lessonii." (2.) The notch, or sinus, at the left-hand margin of the deck is deep and V-shaped, although in some specimens from San Pedro that are referred to this species, this notch is more nearly U-shaped and not as deep. (3). Specimens are frequently rather large, broad flat, and cuneate with the narrower end toward the apex. This is thought to be the normal form in which the shell has had an unrestricted growth. Like many Crepidulas , however, the shape of the shell varies with the situs.

Among the Academy's lots of Crepidula from the southern fauna there are a few shells of the general form of nivea, but which differ in having a series of well-incised, interrupted striations radiating from apex to margin. In some others these striae are weak or hardly noticeable. These are thought to be the form striolata Menke, mentioned above by Carpenter . This particular form is not found in California, so far as known.

There seems to be good evidence that C. nivea does extend into California. The situs form glottidiarum Dall,1905, in the writer's opinion was properly allocated to nivea by Mrs. Oldroyd. It has the thin, papery periostracum of a totally different nature from that of nummaria, to which it does not appear to be at all closely related, as Dall indicated it in Bull. 112. Specimens of the broad and cuneate, flat form of nivea with traces of periostracum are in both the writer's, the Gordon, and the California Avademy's collection from San Pedro. How much farther north it is to be found is not known, nor can further information be given on any extension of the southern end of the range below Panama.

Before leaving nivea, it seems necessary to observe that the shells from San Pedro mentioned above are hardly to be distinguished from shells of C. plana Say collected on the Atlantic coast. While there are minor differences between the shells of both coasts, these are of such small consequence that they seem hardly worth mentioning. This poses a real problem, for the true C. plana has been introduced with seed oysters from the east coast to Willapa Bay, Washington, where it has bceome established and seems to flourish. Whether the warm water C. nivea and the colder water C. plana are conspecific will be known only from a comparison of their radulas and soft parts. Until this has been done, it might be best to consider them separate even thoggh the shells cannot be told apart, at least in some instances.

Crepidula perforans Valenciennes,1846.

No type locality or description of this species was given in the original publication but the published figures (Voy. Venus, 1846; pl.24, figs. 9, 9a,9b) show an elongate, somewhat frilled, white shell similar to the form commonly found in pholad holes in the shale bed off Monterey and at other points along the California and Lower California coast. This is the oldest name attributed to a white species without periostracum similar to those which come from California. Carpenter (1856:281; 1872:52) first shows it as a synonym of C. exuviata Nuttall, along with C. explanata Gould. Later 1864:654; 1872:140) he considered it a " variety" of C. navicelliodes Nuttall, stating it is " elongated in crypts scooped out by crab or bivalve- explanata Gld.- exuviata Nutt. - perforans Val.

Crepidula explanata Gould,1853.

The type of this species was given by Gould as Monterey. The most recent published figures (Oldroyd, plate 85, figs. 7,8, as C. exuviata Nuttall), as in perforans, indicate that this is a typical pholad-hole form of white Crepidula with the same frilled aspect.

Crepidula exuviata Reeve,1859.

The name exuviata was first published as a nomen nudum in 1839 in Jay's Catalogue, where the species is attributed to Nuttall. Apparently it was not validated until 1859 when Reeve published a description and figure in the Conchologica Iconica. The type locality is given as Monterey and Reeve's figure shows it to be a typical phold-hole form. Thus one can hardly escape the conclusion, based on the descriptions and figures of both species, that C. exuviata (Nuttall in Jay,1839) Reeve,1859, is an exact synonym of C. explanata Gould,1853. In addition, the type localities of both are the same.

Crepidula fimbriata Reeve,1859.

This is a laminarly-frilled, flat shell, of roundish shape,"stained with a livid brown ray on one side." The type locality is Vancouver Strait. Fimbriata appears to be merely another form of white Crepidula, which is common along the coast. Carpenter (1864:565; 1872:51) thought it was an accidentally frilled variety of navicelloides , and later (1864:654; 1872; 140) apparently still thought so. Although Reeve's figure (Crepidula pl.2 figs. 110,116), of the specimen may be somewhat exaggerated, its laminated aspect shows it to be closely related or identical with the form found in pholad holes. The major difference seems to be that in this case the shell grow on a more or less unrestricted situs, such a a flat rock or shell. The brown ray mentioned by Reeve is not a distinctive feature as brownish blotches occur on an occasional specimen of the common white Crepidula from any situs where it is found. The " color form" Mrs. Oldroyd figured as C. nivea is one of these (see her plate 93, fig.9).

Crepidula navicelloides Sowerby,1883.

This is another of Nuttall's nomina nuda published first in Jay. Apparently it was not validated until 1883 by Sowerby, who published a description and figure in his Thesaurus Conchyliorum. The type locality is " California". Sowerby's description is too vague to indicate just what of the white forms he had, but his colored figure in plate 453 (Calyptraeidae, pl.9) fig.143), shows an inside view of a shell that might easily be C. nummaria Gould. This supposition is strengthened further by the slightly yellowish tone around the edge of the figure, as if to indicate the presence of the golden-brown periostracum of nummaria. Furthermore, in the explanation to this plate, Sowerby mentions " osculans C.B. Adams; nummaria and explanata Gld." as if he considered them as synonyms of navicelloides.

Whatever one believes to be the proper allocation of navicelloides, it seems quite obvious that this species name cannot stand as it is preceded by too many others. On the basis of the slim evidence given above, the inclination is to place C. navicelloides (Nuttall in Jay,1839) Sowerby 1883 in synonymy under C. nummaria Gould,1846, rather than in the synonymy of any of the other species mentioned. If this view be accepted, then the figure used by Keep for C. navicelloides in all his editions of West Coast Shells since the earliest in 1881 is not the correct one. It looks more nearly like the common white Crepidula found under rocks along the shores of Monterey Bay and the Monterey Peninsula. It may well be that Professor Keep figured actually the shell that came from this vicinity as he did much of his collecting there.

Crepidula lessonii Broderip,1834.

While this species apparently does not extend in to the Californian fauna it is mentioned because conchologists have assumed that it has a close relationship to some of the other species discussed above- nivea and striolata, for example. In commenting on the species, Broderip states that " it will remind the observer of the upper valves of some of the Chamidae", which gives it quite a different aspect from the other species found in the southern fauna. His colored figures, of which there are four, are inside and outside views of two shells- one a dark phase and the other light. Both have narrow, brown, radiating stripes, and 5 to 7 prominent, rather widely spaced, concentric frills. The brown striping plus the fact that the type locality is the Bay of Guyaquil,Ecuador, quite probably indicate a well marked species, although material is not at hand that answers the description of the species. While other specimens of a flat white Crepidula from the southern fauna have concentric sculpture with a tendency toward a frilled aspect, it is not believed that these are true lessonii.

Crepidula unguiformis Lamarck,1818.

This tongue-shaped white species originally described from North Africa, is reported by Adams and others as having been collected at Panama, Mazatlan, and La Paz. There are no authentic records from California, so far as known, although the suggestion has been made that specimens of this same shape commonly found growing in the apertures of large univalves, such as Natica may be this species. Figures of unguiformis published by Broderip in the Transactions of the Zoological Society of London, and by Tryon in the Manual of Conchology, do not suggest a shell that necessarily grew in a gastropod aperture. Moreover, both figures definitely indicate the presence of a periostracum, which the shells growing in such a situs in California do not have, at least to the writer's experience. Until comparison of the radulas and soft parts of these Crepidulas from both coasts have been carefully compared, the writer prefers to leave the determination of unguiformis as a West Coast species to later consideration and to limit the present consideration to species named from the West Coast.

Crepidula squama Broderip,1834.

According to Broderip, this is a very flat species, the apex of which is " lost in the margin". The type locality is Panama, under stones. The fact that Adams' nivea was also based on specimens collected at Panama is likely the reasonfor considering the two conspecific as both are flat, white species. Broderip(s colored figure of the dorsal aspect to squama however, shows a series of narrow, brown, radiating stripes extending from the apex not quite half way down the back and then becoming obsolete. The rest of the shell is whitish. The figure of the interior indicates a well marked ridge about the center of the septum, running longitudinally. The left sinus of the septum edge is U-shaped, like that in nummaria though not as prominent.

As there are young specimens in the Academy's collection that show these characters fairly well, the conclusion is that squama is a good species, different from nivea as this latter species is now understood.

Thus, in allocating our California species of white Crepidula to their proper taxonomic position, we have the following names to deal with: 1. nummaria Gould,1846 2. perforans Valenciennes,1846 3. nivea C.B. Adams, 1852 4. explanata Gould,1853 5. exuviata Reeve,1859 6. fimbriata Reeve, 1859 7. naviceloides Sowerby,1883.

Collecting experience and examination of the material available has brought the writer to the conclusion that there are but three distinct species of common white Crepidula native in California. These are:

1. The large, heavy shell with a golden-brown periostracum.
2. A thinner, flat shell with a thin, papery, light-yellow or almost colorless periostracum.
3. A third species, without periostracum but usually with incrustations, with a fairly coarse and rough shell, extremely variable in size and shape, of which the following three situs forms are common:
   a. The pholad-hole form, generally tongue-shapes, which is frequently frilled at the sides and the apical end.
   b. The smooth, tongue-shaped shell (when adult), found in the apertures of medium or large , dead, gastropods.
   c. A free-growing form, usually rough and heavy with the back incrusted, though sometimes rather thin, smooth and clean. Found on the undersides of large rocks.

Matching these to the list of names leads to the following conclusions on the species of white Crepidulas from California, which are offered here for purposes of further discussion:

1. Crepidula nummaria Gould,1846.
   Type locality: Classet, San Juan Strait, B.C. Present known range: San Juan Strait, B.C. to Magdalena Bay, Lower Calif. Synonym: C. naviceloides Sowerby,1883. This is the species No.1 of the preceding list.
2. Crepidula nivea C.B. Adams,1852/
   Type locality: Panama. Present known range: San Pedro, Calif. to Panama. Synonyms: none assigned, at least from the names applied to white Crepidulas reported from California. This is the species

No. 2 of the preceding list.

2a. Crepidula nivea glottidiarum Dall,1905.
Type locality: San Pedro Bay on the brachiopod Glottidia albida Hinds. Present known range: Santa Monica Bay to San Pedro Bay, California. A situs form of questionable taxonomic standing.

3. Crepidula perforans Valenciennes,1846.
Type locality: unknown but probably West Mexico or Central America. Present known range: Northern Alaska at least to Lower California. Synonyms: C. explanata Gould,1853; C. exuviata Reeve,1859 (= explanata); and C. fimbriata Reeve,1859.

Being the oldest name, perforans has precedence in the allocation of the proper one to cover species No.3 of the preceding list. In the Manual of Conchology (v.8, p. 115), Tryon rejected the name as a " designation representing an untruth" on the basis that Valenciennes thought the animal actually bored the hole in which it lives. However, even though no description was given originally, the name perforans was properly " designated" under the Rules of Nomenclature, as interpreted now, can be applied with reasonable certainty to a well-known form common in collections, and is therefore a valid one. While unfortunate that the name perforans originally was intended for the pholad hole form, there appears to be too much evidence of the extreme variability of this species to warrant the use of more than one name for these shells.

Crepidula adunca Sowerby,1825.

This well-known, distinctive species, with deep-set deck, hooked apex, and brownish color hardly calls for any comment except that a southern California species generally found on Norrisia was thought by some early collectors to be closely related, which is probably true. C. rostriformis Gould,1846, is a synonym of adunca. Its type locality is the Strait of San Juan de Fuca.

Crepidula arenata Broderip,1834.

In the Ashmun Collection, along with a large series of fine specimens of C. norrisiarum Williamson, there is another species of Crepidula that could be immediately separated. Comparison with a large number of arenata in the California Academy and also with specimens in the Stanford Collection prove without doubt that these shells are C. arenata. This adds a new Crepidula to the California list and extends the range of the species to San Pedro (Not La Jolla, as in Minutes, No. 56, p. 14). The entire lot of shells was taken from Norrisia norrisii, and, it might be added, included a few juvenile specimens of C. onyx Sowerby, thus making three species of Crepidula to be found on Norrisia.

In discussing C. norrisiarum (Nautilus, 19:50), Mrs. Williamson mentions a " white porcellanous specimen, shaped like some Crepidula rugosa," and of finding later two live specimens " maculated with chestnut spots". It is therefore possible she had specimens of C. arenata also, a fact that could be checked by someone with access to the Williamson collection. Specimens of arenata from San Pedro are thinner in shell texture than those of norrisiarum, are maculated with brown spots or streaks, and have a rather large, often prominently swollen apex generally depressed to the level of the periphery of the shell. The deck is deep-seated and the apex is excavated internally. Broderip discusses arenata as follows: " This approaches Crepidula porcellana Lam. The septum is somewhat distant from the margin; and the apex, which is also somewhat distant from it, is obtuse, and obliquely turned to the right side." The original specimens were collected in sand, mud, in 6-8 fathoms.

The original figure of arenata is of a much smaller shell than excavata, with a much smaller apex. The dorsal view has two light-colored stripes radiating from the apex, with narrow, interrupted, brown pencillings over the rest of the shell. The inside view shows short, brown stripes at close and fairly regular intervals all around the periphery, with some additional brown streaks in the central area.

Crepidula excavata Broderip, 1834.

Examination of the original figures and those given in Reeve's Conchologica Iconica, and in Tryon's Manual, raises the question why this name has been associated with a Californian species. The figure is of a large shell with the appearance of a heavy ridge along the back and suggests a species much more nearly related to C. arenata Broderip. The type locality is given as Nicaragua but Dall gives a range north to Monterey. J.G. Cooper apparently was the first to credit this species to California by citing " Crepidula excavata var. jun. Santa Barbara Island" (Cpr. Rept. 1872:98). Johnson and Snook, p. 538, fig. 597 refer to excavata as a thin shell with almost parallel sides, whitish, and mottled with brown except for a white deck. This is certainly not the excavata figured by Broderip and Reeve. Dead shells, similar to the one figured by Johnson and Snook, were picked up on shore at Terminal Island by the writer in 1910 when San Pedro Harbor was being deepened by dredging. Subsequently, similar shells were found in the Ashmun Collection collected at San Pedro, evidently alive, and in the Gordon collection also from San Pedro. One of Ashmun's specimens was in situ on a small round stick of a type not commonly dredged. From this one is led to conclude that these shells and the one figured in Johnson and Snook are a deep water situs form of C. arenata Broderip. Such a conclusion would be an extremely doubtful one were it not for the Ashmun and Gordon material, but under the circumstances there seems to be no other suitable identification.

The California Academy has no specimens that conform exactly to the figure of C. excavata and all records indicate it to be in the Panamanian fauna. Nothing like it has been found at Monterey, so far as known, and consequently Dall's record from there is thought to be based on a misidentification.

It would not be at all surprising to find, when more material comes to hand, that excavata and arenata are conspecific. Specimens of the latter species in the California Academy's collection from Central America suggest an approach to Broderip(s figure of excavata. In commenting on excavata, Broderip said: " This species is remarkable for the depth of the internal margin before it reaches the septum formed by the plate. In Crepidula adunca Sowerby, this depth is even greater than it is in Crepidula excavata. The apex is close to the margin , obliquely turned toward the right side." The dorsal view of the shell shows at least three series of dark spots radiating from the apex on the very early part of the shell only. These end abruptly and the rest of the shell is fawn-colored, without maculations of darker color.

If arenata and excavata are finally determined to be conspecific, as is strongly suspected, the name excavata would undoubtedly take precedence, with arenata as a synonym. Broderip described both species on the same page but excavata was treated first, being species No. 29, while arenata is species No. 30.

Crepidula norrisiarum Williamson, 1905.

Early collectors confused this species with C. adunca Sowerby, perhaps with good reason as the two seem closely related. It has also been linked with C. excavata/. This Crepidula is a familiar one to southern California collectors, being distinguished largely by its habit of growing on Norrisia and Natica, and by its peculiar magenta-pink color in the interior. All specimens seen lack the brown spots and maculations of areanta, although young specimens have a series of fine, interrupted, light-brown stripes radiating from the apex, which become obsolete when the shell is fully grown. The apex is much smaller than in arenata and is generally dark magenta-pink. Most shells show traces of a thin, light-brown periostracum, which is more evident on young specimens.

The specific rank given this form by Dall in Bull. 112 appears to be correct procedure. It is obviously not related to C. rugosa Nuttall (= C. onyx Sowerby), as originally placed by Mrs. Williamson.

The only specimen of norrisiarum in the writer's collection, other than those from southern California, is an adult shell found growing on a young red abalone at Point Reyes, Marin County, which may not mark the northern limit of range. It would be interesting to know whether the species has been found living in any other situs than on shells.

Crepidula excavata naticarum Williamson,1905.

Mrs. Williamson described this as a white porcellanous shell with brown spots, which leads to the suspicion that C. arenata might be the proper identification unless, on investigation, the type in the Los Angeles Museum turns out to be C. norrisiarum. Specimens labelled naticarum collected by the Burches at Ensenada, in the Estero (Gordon Collection), seem definitely assignable to arenata and not to norrisiarum. In either event the form naticarum would have little taxonomic standing.

Crepidula onyx Sowerby,1825.

C. rugosa Nuttall appears to have been generally accepted as a synonym. The northern end of the range placed at Monterey by Dall, seems doubtful. So far as is known there are no authentic records for this species from this far north.

Crepipatella orbiculata Dall,1919.

This is a rare deep water species dredged in 50 fathoms or more. There appears to be little doubt that it is a Crepipatella.

Crepidula glauca Say,1822.

With the decline of the oyster beds in San Francisco Bay, this species does not appear to be flourishing there. Hemphill collected both dark and light phases at Alameda. More recently, Dr. G.D. Hanna has collected the light phase only living at Rodeo in San Pablo Bay. C. convexa is a situs form according to C.W. Johnson.

Crepidula incurva Broderip,1834.

The San Pedro record seems extremely doubtful. Material in the Californoa Academy collection range from Magdalena Bay to Panama.

Crepidula aculeata Gmelin,1792.

Have seen no authentic specimens from north of Cayucos.

Crepipatella lingulata Gould,1830.

No comment on this common California species is necessary. C. dordata with which it was earlier confused belongs in a more southern fauna and does not come into California. Dorsata appears to be a good species and is not a synonym of lingulata . Specimens in the Academy collection range in locality from Mazatlan to Panama,

In conclusion the writer wishes to acknowledge the help and advice of Dr. Leo G. Hertlein, of the California Academy, in the process of preparing these notes.

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Mr. A.G. Smith, author of the above paper on Crepidula , in his personal letter to the editor makes a few interesting comments that do not appear in the paper. We are taking the liberty of running a few excerpts from this letter. " You will find that I have changed my mind on some points, principal among which is that C. nivea should be limited to a specific shell that I have not seen north of San Pedro and that C. perforans is another species going clear to Alaska in the north and overlapping the range of nivea by extending south along the Gulf and the coast of Lower California. Leo doesn't altogether agree with me on this as he thinks that the characters I have used to separate nivea from perforans may not be enough to make identification certain. He has a real point, I think, but at the same time is unwilling to admit that any of our West American species can actually have a range extending all the way from Alaska to Panama and perhaps farther south. One piece of evidence that I do not have and that I would like to verify is whether the tongue-shaped form found in the apertures of gastropods of Lower California and the Gulf ever have a periostracum. If they do, they are nivea; if not, they are perforans according to my present view. None of my California specimens of this form have it so far as I can see. Then there is the further question whether the hermit crabs might not wear off the extremely thin, papery, colorless periostracum that I now believe is characteristic of nivea. I realize my idea of nivea is not based on too strong evidence, because it has been arrived at by the process of eliminating other possible species names- a sort of reductio ad absurdum.

Having seen your C. naticarum from Ensenada Estero strengthens my supposition that this subspecies is really arenata. I hope you or some one will be able to check the Williamson collection on this point.

On the subject of C. convexa glauca, I note that Johnson in his " Fauna of New England" reverses the names, as Packard did, but speaking of the subspecies convexa he says: " A form due to growing on the shells of Alectrion obsoleta and other very convex surfaces." Gould (Invertebrata of Massachusetts,1941, p. 160) says that Say described convexa from dead shells and " had not seen its true colors". My own opinion would be to throw convexa into the synonymy of glauca, which has page priority in Say's original paper, on the basis that it is merely a special situs color-form of little real taxonomic value."

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Additions and Corrections

In connection with our discussion of the genus Crepidula attention should be called to the extensive and beautifully figured work done in recent years by Dr. Wesley R. Coe, Professor of Biology, Emeritus, Yale University but now associated with the Scripps Institution of Oceanography at La Jolla.

The careful student of this group should certainly study the following publications by Dr. Coe.

Coe, W.R. 1935. Sexual phases in Prosobranch mollusks of the genus Crepidula. Science, 81:570.

Coe, W.R.,1936. Sexual phases in Crepidula. Jour. Exper. Zool., 72:455

Coe, W.R.,1938. Conditions influencing change of sex in mollusks of the genus Crepidula. Jour, Exper. Zool. 77:401.

Coe, W.R.,1938. Sexual phases in the gastropod Crucibulum spinosum. Jour. Morph. 63:345.

Coe? W.R. Influence of association of the sexual phases of gastropods having protandric consecutive sexuality. Biological Bulletin 75:274-285.

Coe, W.R. The reproductive organs of the Prosobranch mollusk Crepidula onyx and their transformation during the change from male to female phase. Jour. Morphology vol. 70, no.3, May,1942.

(con.)

Coe, W.R. Influence of natural and experimental conditions in determining shape of shell and rate of growth in gastropods of the genus Crepidula.

Incidentally it should be mentioned that Dr. Coe has made many very interesting comparisons between the species of both this coast and the Atlantic coast.

The following interesting personal communication is from Dr. W.R. Coe: " If you will refer to Plate 2 of the paper on influence of environment on shape of shell in Crepidula you will note that the largest size of the species nummaria (nivea) at the aperture of the shell of Tegula is only 10-16 mm., while the same species in the shell of Polinices may become more than 30 mm. long and 20 mm. wide or even larger. The same large size is reached under stones and on the sides of piles, etc. Associated with these large females or attached to them are one to many small males. You will recall that the young of all species of this and closely related genera are exclusively male, the male changing to the female phase on reaching a certain age, commonly about 4 to 6 months in this region. This species closely resembles C. plana of the Atlantic coast which has corresponding responses to substrate. The shell becomes wrinkled, instead of smooth, if the animal is frequently disturbed. The yellowish epidermis is usually rubbed off wholly or partially if within a shell occupied by a hermit crab leaving most of the surface pure white."

" I think your notes on this genus are substantially correct."

Attention should be called to the fact that in several of the papers mentioned above Dr. Coe has some beautiful figures of the anatomy or soft parts of a number of the species of Crepidula. These papers should be considered in connection with the previous paper.

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Dr. Joshua L. Baily Jr., San Diego, Calif. " In your last bunch of notes you have quoted a letter from me in which I made a mistake. I said that in my opinion Crepidula norrisiarum looked like a good species, but that Dr. Coe at La Jolla had raised them and disagreed with me. Dr. Coe has written me that he has raised several species of this genus- but that C. norrisiarum is not one of them. Consequently he should not be quoted as expressing an opinion. I depended on my memory when I wrote you, and made a mistake."

Dr. Fritz Haas, Curator of Lower Invertebrates, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois. " In my last letter to you I alluded to the living base on which the Catalina Island specimens of Pediculariella californica were found as a Hydrocorralline belonging to the genus Millepora. Now I find out that, though the animal in question is a Hydrocoralline, its exact name is Allopora californica Verrill.

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Mr. E.P. Chace, 24205 Eshelman Ave., Lomita, Calif. Mr. Chace has given us some further discussion of the Acmaeidae.

" Acmaea- Some comments on Dr. Test's grouping. Placing instabilis and incessa in different grpups and same for depicta and paleacea, looked odd to most of the club. However, we may be converted when Dr. Test's paper is published and we all have a chance to study it.

A. fenestrata fenestrata- O.K. but personally why give the northern form a separate varietal name because it is always eroded. When we get north next summer I hope to find some fenestrata that are not eroded and also to get a growth series or two.

(con.)

Acmaea paleacea- some of the club say " Not always on the open coast."
Acmaea tessulata- Club somewhat at sea on this section.. My idea is that the shells that George Willett collected at Grant Island, Alaska may well be the same as the Atlantic species, but that is the same as the thing from California that we have been calling A. patina or A. scutum is open to question.
A. ochracea Dall- I agree with Mrs. Test's remarks on this species. However, I sent some shells from Topango coast (north of Santa Monica) and she returned one marked A. ochracea. My own idea of this shell is a young light colored A. pelta. Shape, sculpture and aperture all say pelta to me. Another specimen of the species I know as pelta but a dark colored on was returned marked A. asmi. I would liket to see the shells collected from Prince William Sound by Eyerdam stated to be ochracea.
Acmaea triangularis- I believe the Alaska record is probably based on the thing that George Willett collected and called this species but later decided was Dall's parallela. Also ??? did Dr. Test have the living A. triangularis from Monterey or was her work based on the Alaskan shells ?
Acmaea limatula- Believe that the northern records of this are based on misidentifications. We could not find it at Crescent City nor in De Poe Bay collecting. Did you ? (Answer- No.)
Acmaea atrata- Dr. Gregg's specimens are definitely A. conus Test. The Piedros Blancos record is therefore based on a mididentification.
Lottia gigantea- I question the Crescent City record. Northern limit needs verification. Will see what I find next summer.

Mr. Chace sends another correction: " The Littorina newcombiana that we had at the club meeting some time back were from the original lot and not of our collecting as you stated in the Minutes. We hunted for them but did not find them.

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Pleurobranchus chacei Burch,1944. This species was described and figured in the Minutes but no type specimen was selected because it was thought that the species would prove to be conspecific with Pleurobranchus californicus Dall,1900 . However, Mr. and Mrs. E.P. Chace recently discovered some alcoholic specimens in their collection and now the validity of the species can be definitely determined.

Therefore a holotype has been selected and placed in the California Academy of Sciences. A note from Dr. L.G. Hertlein is self explanatory " I think that you are absolutely correct that each species described should be represented by a type specimen even though the name may be completely abandoned. It often happens that the name may be used by later workers and it then becomes very important to have a defimite type for comparison. We are happy to add the specimen to our type collection ...."

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A. Byron Leonard, Department of Zoology, University of Kansas, Lawrence, Kansas. Here is a puzzle for Dr. W.O. Gregg to answer. " For example, since I have encountered many fossil shells of slugs in my study on fossil gastropods, I was very much interested in Dr. Gregg's notes on the Land Slugs of Southern California, with particular reference to the question of whether Deroceras gracile is a native American species or an immigrant from Europe. The problem is certainly a puzzling one because fossil shell plates of the size of the native Deroceras apparently do not occur in this region. This leads us to a dilema, if Deroceras is not a native genus, then it seems necessary to discard the hupothesis that the shell plates I find as fossils represent an ancestral form of the living pppulation of Deroceras."

Professor Ralph W. Dexter, Kent State University, Kent, Ohio. " I believe the name Littorina rudis Donovan 1800 which appears on pages 11 and 37 of issue No. 55 (Dec. 1945) of the Minutes of the Conchological Club of So. Calif. should read Littorina saxatilis Olivi 1792."

David Nicol, Box 2466, Stanford University, Calif. " I have been trying for the past year to get some specimens of Glycymeris with the soft parts preserved. I have asked the U.S. National Museum for specimens, but Dr. Heath has used all of them. Do you or any of the Conchological Club members have any of this material ? Even a cursory examination of the soft parts to ascertain the correct orientation of the shell would be of tremendous value. I will send you reprints of two preliminary papers on the Glycymeridae as soon as I receive them."

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Minutes of the January Meeting of the Conchological Club of So. Calif.

The Conchological Club of Southern California met at 7:30 P.M. Jan . 8,1946, a week late, due to the fact that New Year's day fell on the regular meeting date. There were 14 members present, and three visitors all of whom expressed a desire to become members. They were Jim Bailey, 725 W. 115 St.; Arthur D. Howard, 2307 W. 20th St.; and Marshall Sohl Jr., 1433 W. 134th St., all of Los Angeles.

Minutes of the previous meeting approved as printed.

Under communications were a greeting from Mrs. Ora Willett of Kent, Washington, and a letter from Mrs. J.M. Lane, 1475 S. Roosevelt Ave., Pasadena telling of the passing of J.M. Lane on Jan. 1,1945 and her continued illness from which she has only partially recovered and of which the members of the club are sorry to learn. She also spoke of the continued ill health of Mr. Crowhurst and of the robbery of his store at 238 S. Spring St., Los Angeles. While not a member of the club Mr. Crowhurst was always a booster in its behalf, and the secretary is but one of many ho has induced to attend the meetings.

Mr. and Mrs. Harrt Turver recently spent some time collecting at Guaymas,Mexico and brought for distribution a very interesting box of duplicates. That they wery rapidly dissapeared is a forgone conclusion.

The prepared lesson was then taken up, the subject being Acmaea, a tough assignment for most of us,and there was considerable discussion, lasting well beyond the hour for closing. The meeting was then adjourned.

Effie M. Clark, Secretary.

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Mr. F.M. Bayer, 1234 Country Club Prado, Coral Gables, Florida. Note Ted's new address. " When I wrote you before my plans were poorly formed. I have come to Gainesville only long enough to resign my position here. I am returning to the University of Miami, and am continuing my schooling accompanied by my companion in collecting over some 10,000 miles of sea and jungles. I will have some interesting news of mollusks when I get a chance to work over our material from the Pacific." We will be very happy if Ted will write a paper on his shell collecting experiences for publication in our minutes.

Mr. Walter J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. " Mr. H. Harry was over from the navy several times during the holidays and brought out an assortment of marine and land shells which he collected at Tsingtao, N. China, Okinawa, Iso Jima and Palau Islands. There were about 75 species. I classified all except about three of them.

Several weeks ago I received from the University of Uppsala,Sweden, Bengt Hubendick's monograph on the genus Siphonaria in German. It deals very thoroughly with all characteristics of anatomy, evolution and distribution of the species of this family. Very few families of mollusks

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have been dealt with so thoroughly. There is a long summary in English of all salient points in the work. This book should be in the possession of all advanced students working on the anatomy of mollusks."

" Note* - It would be interesting to know the price of this work and all other foreign publications and the name and exact address of the proper person or department to send the order or request.

Mr. Eyerdam also enclosed a few collecting records that arrived too late for publication with the general discussion. They follow:

Hipponix barbata Sowerby- Mazatlan, Mexico,1938.
Calyptraea mammillaris Broderip- Corinto, Nicaragua.
Calyptraea radians Lamarck-.Corinto, Nicaragua.
Crepidula nummaria Gould- Corinto, Nicaragua and Gulf of Fonseca,Honduras.
Crepidula onyx Broderip- Corinto, Nicaragua
Polinices uber Valenciennes- Corinto, Nicaragua and Acajutla,Salvador and Gulf of Fonseca, Honduras.
Trivia solandri Gray,1837- Corinto, Nicaragua.

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We feel honored that we have a request for a complete file of our Minutes from the Library of Congress, Washington, D.C. We sent them two copies of our bound work on the Pelecypoda but were not aware that they would care to file all of our papers monthly.

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Hon. R. Winckworth, 71 Whitworth Road, London SE 25, England. We are pleased to have a nice letter, and flattered by the commendation of so eminent a conchologist. We are sorry to learn that Mr. Winckworth has been ill. " I have very much appreciated the interest and excellence of the Minutes of the Conchological Club of Southern California, and would like to be a contributor.. I have sent you separately a copy of my list of the types of the Boltenian genera, which you kindly noticed in the minutes. I will gladly send you copies of any other papers of mine you would like, but few of them have any bearing on California shells. I am chiefly interested in the mollusks of the Indian Ocean, shells and nudibranchs. I had at one time a large collection of British shells, which went to Liverpool Public Museums before the war and was destroyed when Liverpool was bombed in May,1941. Although my house has twice been badly damaged by neighboring bombs, neither my library nor collections have suffered here (apart from some broken Nautilus- which did not matter, as I had already studied them).

I have now retired from the Royal Society though I often go in (when well) as ' Consulting Editor' usually three days a week, but my home address is best."

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Minutes of the Long Beach Shell Club- December,1945

The Long Beach Shell Club had the Christmas meeting with the Ulrichs in Wilmington, and it was a grand time. Twenty four were there, three of them new members and Dr. Wentworth was back with us after a long absence. Mr. Baker called the meeting to order and asked the chairman of the nominating committee to report. The following names for 1946 officers were presented and voted: President, Mr. Baker, Vice-president, Mrs. Libby, Secretary, Miss Eaton.

Reports of collecting trips were to the effect that sea life has changed greatly as to locale during the war, and many old collecting grounds are devoid of material. The complete cause is still not explained.

Next meeting will be held the second Sunday in January, 2:30 P.M. in the library basement. It is about decided to make bo change of time or place for the future if the library can still let us use the basement as in war time.

Mr. Ulrich then entertained the group with his sleight of hand performances, to the delight and mystification of all especially by Ralph Bormann Jr. who was back with us.

After an enjoyable lunch planned by Mrs. Ulrich and her assistant Mrs. Libby , Santa distributed the shell packages and the Ohs and Ahs showed the pleasure of all. A grand host and hostess are Mr. and Mrs. Ulrich and we are happy to have been there.

Next meeting topic will be " Experiences of the December low tides."

Ruth E. Eaton, Secretary.

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Mrs. Wm. B. Smith, P.O. Box 373, Arlington, Texas is interested in purchasing shells.

Flora J. Andrews, 814 N. Vassar Ave., Albuquerque, N.M. wishes to buy shells.

Dr. R.P. Burke, Bell Bldg., Montgomery, Alabama is interested in buying shells.

Mr. and Mrs. E.W. Boerstler, P.O. Box 494, Corona del Mar, Calif. Most of us will envy the Boerstlers their collecting excursion to Mexico. But they exchange and if you have anything good in the line of duplicated perhaps you can still get some of that Mexican material.

Miss Norma Thompson, 1800 Dixon, Des Moines, Iowa inquires about buying shells.

Mr. George W. Bemart, 1144 Whitney Ave., Hamden, Conn. Mr. Bemart has a collection of shells but none from the west coast and asks about either an exchange or a purchase of a series of west coast shells.

W.G. Parris, Boom, Tenn. We have many fine sets of land and freshwater shells from Mr. Parris. He writes that he has had little time for his exchanging during the past year but " I hope to have time to exchange shells with any one who desires specimens of my shells ." Mr. Parris' son Tom is living at 765 Lafayette Ave., Brooklyn, N.Y.

Mr. and Mrs. H.R. Turver, 8640 Evergreen Ave., South Gate, Calif. Another lucky couple making a collecting trip to Mexico. In the past they have brought back several new species and many fine things. No doubt this trip will be as good. They exchange and have rare things to offer.

L.M. Wright, CEM, U.S. Navy, Enterprise, Florida. " You are doing wonderfully well and I herewith tender $2.50 for the 1946 issues which you will grind out in the magic mimeograph. Also when possible I will keep my promise to send the shell club members a box of Florida marines."

Mr. Charles D. Nelson, R#5 Lake Michigan Drive, Grand Rapids, Mich. " You will find enclosed my check for $2.50 to continue my name on the mailing list to receive your C.C.S.C. Minutes which still sets the pace for any similar publication." Thank you.

Mrs. F.K. Hadley, 14 Vincent St., Box 33, West Newton 65, Mass. All shell collectors should by all means write Mrs. Hadley and ask to be placed on her mailing list. She is a dealer in fine correctly classified specimens . Her new bulletin will be issued immediately. " Thinking you might be interested in seeing what I am doing in the shell line, I am sending you a copy of my new Bulletin which should be out some time next week. It is about ready to go to the mimeographers. I am enjoying the shell business greatly and remember with pleasure our contacts with the Burches, when we were first getting started. It is my intention to get out Bulletins frequently as it stimulates interest in shells."

Mary Mouat, 9 Queens Parade, Davenport, Auckland, New Zealand. " I thank you very much for the notes of your club. You go to a tremendous lot of work to get such details. I am posting a box of shells unnamed of our N.Z. shells for your club. I know so many have these that there would be no trouble for you to identify them. If any would wish for more please let me know. I hope to have a trip further north to collect shells which we can get no further south. Our club is growing, but so far we have not heard of any club in any other part of N.Z. which is a pity, as out country goes right down to the cold southern seas. Hoping the shells arrive safely and are of use believe me, yours sincerely."

Mildred Cannon, Studio, Distinctive Gift Items and Souvenirs, Original Designs in Costume Jewelry, Sea Shell Specialties, Tropical Handicrafts- Indian River Drive, Route No. 1, Box 615, Fort Pierce, Florida.

" Enclosed is check to your order for $2.50. It seems a very good idea of yours to have " contributions" fixed at $2.50 per year. The Minutes of the Conchological Club of Southern California record serious studies in the conchological field, and all students of that field will know that the sum is very low for the authoritative data. During the war years the freedom to range the long coast line of Florida in the interests of field collectingwas very much restricted. Also, the past year saw the largest increase in my shellcraft business I have ever had. However, I hope to have much time in 1946 to devote to field coll cting. It was my first love and I will be happy to return to it."

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The January Bulletin of the Natural History Museum of San Diego, Calif. is at hand. Among the many interesting activities of this fine institution appear the following new acquisitions . " Mrs. F.B. Sumner of La Jolla presented some 2000 specimens of a certain eastern sea shell which had been collected near Woods Hole, Mass. by her late husband for the purpose of demonstrating its wide range of color. Chaplain B. Ever Roberts forwarded still another large box of shells from the Sdmiralty Islands. Lieutenant Robert E. Lando has sent a succession of gifts chiefly shells and insects from Florida. etc. etc. "

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Mr. F.E. Shafer, R.R. 1, Trenton, Ohio. Mr. Shafer was one of our exchange correspondents in Ceby, Philippine Islands. We are very happy to have the following letter from him and learn that he is still with us.

" The war vs. yours trully is briefed as follows: taken prisoner April 10,1942. House looted, burned library, shell collection, documents, everything lost or destroyed. A day or two after the Japs got me. When the American civilian prisoners were removed from Cebu to Manila, six American men, all old and all sick, were left at Cebu. I was one of these six. Four of the six died, one is paralyzed and the lucky guy is me. I am in fair physical condition now and hope to return to the Philippines some time this year. It will be easier for me to salvage something from the wreck if I am on the spot. Hence the P.I. try. Also I like the islands very much and if post war conditions permit, I want to live there again. I was there for over 43 years with only 4 vacations to the states. Perhaps you may know of Mr. Pedro de Mesa of either Manila or Lubang, Mindoro- who is a real shell man- the discoverer of several new species of land shells. Mr. de Mesa is my very good friend and just before the war we were planning to make a three-man coverage of the entire P.I. archipelige. Of course, we would need many local agents and had the idea of using country school teachers. We felt that islands like Samar and Palawan had been neglected by both scientists and collectors and that new species- land species- would be discovered. Mr. de Mesa and I had much in common and if the war had spared him, I hope to see him within this year, and to get busy again with marines at least. I am very ignorant of land mollusks and was under instruction by de Mesa re same , when the war came on. So I hope to get going before many months on marine shells with headquarters at Cebu City again.

I will greatly appreciate any help you can give me towards obtaining books and pamphlets or catalogues pertaining to conchological matters. I have absolutely nothing of shell literature now and would like to spend some of these long winter days remaining reviewing on marines. So if you will kindly give me addresses, titles etc. whereby I can equip myself with books etc. I have forgotten the name and address of the Rochester, N.Y. shell dealer, who sold shell catalogues and shells. Can you furnish me with his address ? If you will kindly write to me re shell literature as above cited, I will be very much obliged to you. Right now I am not in a position to reciprocate such a favor but do hope to have an answer.

I had a fine marine shell collection- Philippine, which was approaching completion (except for Conus gloria maris), when the war came on. I want to collect P.I. shells for myself and incidentally for my friends again. "

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Commonwealth of the Philippines- Department of Agriculture and Commerce Office of the Secretary, Manila- Eduardo Quisumbing, Chief, Natural History Museum. Dec. 28,1945. We have many fine specimens in our collection sent us by Mr. Quisumbing in exchange for California shells. Having sent many sets of shells under our label to him we are personally interested in their destruction by the Japs and find the following letter of particular interest: " Your letter of September 2 was just received and hastily replied to apprise you of damages we have suffered from the war. All the scientific collections of the Natural History Museum including the entire conchological collections were completely destroyed by the Japanese. The Japs deliberately dynamited and burned the Bureau of Science where the Natural History Museum was housed. We are going to start from scratch. We have plans to start collecting shells, but are prevented for lack of sufficient funds for collecting trips. We are presently occupying in a temporary way a portion of the ruins of our building. It may take us years before we can hope to have a new building. I should like to know if there are collections of shells for sale in the United States so that when funds become available I may be able to purchase them. How about exchanges ? I am interested in exchanges as this would be one way of building up our collections. Donations will surely help us rehabilitate the collections. The scientific library of the Bureay of Science, which housed one of the largest and best known collections of technical and scientific publications in this part of the Orient is no more. It was totally destroyed also."

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Family Haliotidae

Genus Haliotis Linnaeus,1758. Type (by subsequent designation, Montfort,1810), Haliotis asinina (Linnaeus).

The only recent contribution to the literature of this genus in our library is Bartsch, Paul, Proc. U.D.N.M., vol. 89, no. 3094, 1940 " The West American Haliotis".

There have been a number of subgenera described but presumably all of our species belong under Haliotis s.s.

Haliotis cracherodii Leach,1814. Coos Bay, Oregon to Santa Rosalia, L.C. Type locality: California.

Our common black abalone is easily recognized by its nearly smooth shell. It could only be confused with H. californiensis Swainson. Grant and Gale state " It seems to favor rocks not thickly covered with algae and is supposed to subsist on diatoms."

A number of subspecies have beend escribed. H. cracherodii splendidula Williamson,1892 (Proc. U.S.N.M., vol. 15, p. 198) is a color form from Point Vicente stated to have brilliant blotches of color in the interior. Dr. Bartsch places this in the synonymy with approval of the majority.

The imperforate shells have been given several names, the best known perhaps being H. cracherodii holzneri Hemphill,1907, which seems to be without much doubt the same thing as H. cracherodii imperforata Dall,1919. We have collected these shells on numorous occasions and in our opinion they are simply abnormal individuals and the names have no significance. But if they do, why the same abnormality in other species has not been named I do not know. Imperforate specimens of Haliotis fulgens are perhaps even less rare. The last perfect specimen of an imperforate H. fulgens coming into our hands was from Malaga Cove, L.A. Co. It is now in the collection of Mrs. Hattie Gemmell of San Jose, Calif. We attach no significance to the form. Therefore the article by Dr. G. Dallas Hanna in Nautilus 41:35 in which he discusses Haliotis cracherodii lusus Finlay (Trans. New Zealand Institute, vol. 57, 1926, p. 492) (new name for H. c. imperforata Dall- preoccupied) is of little interest in my opinion other than perhaps adjusting the synonymy.

Collecting data: The most abundant littoral species collected in any numbers desired from Monterey, Cayucos, Morro, Malaga Cove,Point Vicente, Point Firmin, Laguna, Punta Banda, L.C. (Burch).: P.M. Connolly brought back specimens from San Quintin Bay, L.C., Mexico: Half Moon Bay, Calif. (Emery); Magdalena Bay, L.C. (Hemphill); Santa Rosa Island (Fleming); San Clemente and San Nicholoas Islands (Lowe); Coronados Islands (Stephens)

Haliotis cracherodii californiensis Swainson,1822. On the islands; the Farallones to Guadalupe Island. Type locality: California.

This species resembles H. cracherodii Leach in every respect other that that it has from 12 to 16 small perforations usually almost flush with the surface of the shell. Most of us have been disposed to consider this a distinct species, but Dr. Bartsch in the paper cited above reduces it to a subspecies stating " for the organisms on Cerros and San Bonita Islands form perfect intergrades between the typical H. cracherodii and H. californiensis ..."

A subspecies of this form was described by Orcutt, Haliotis californiensis bonita Orcutt, 1900. This is another abnormaility in that some individuals have a supplementary shell deposit in the interior. The same thing occurs occasionally in other species, and the general opinion is that it is of no significance. Dr. Bartsch discusses it on p. 57.

Collecting data: The only specimens in our collection came from Guadalupe Island collected by the late Dr. Fred Baker (Burch); there are specimens in the Lowe collection in the San Diego Museum so labelled from Todos Santos Bay and also San Pedro. Both the Lowe and Baker collections have specimens also labelled with the name bonita mentioned above.

Haliotis rufescens Swainson,1822. Point St. George (Thompson) and Crescent City, Calif. (Chace) south to La Paz, L.C. and the Galapagos Islands. Type locality: Galapagos and California.

Dr. Bartsch gives the range Mendocino County south to Catalina Island. However, I have personally collected it from the coast south of Todos Santos Bay, L.C.

Our most common commercial species is well known by its brick red color, large size, light spiral sculpture and radiating waves. Grant and Gale make an interesting note " Curtner determined that California specimens six inches in diameter were 9 years old, those 8 inches in diameter 13 years old."

Collecting data: The common food species brought into Monterey and Morro Bay canneries and packing plants. It is probable that a good many questionable localities have been placed on the record from specimens collected from the backs of these shells. I forgot who it was that collected over 50 species from the back of one large H. rufescens, I do not doubt it. Small species of almost every group seem to come up on these, sponge covered with Cerithiopsis, Tylodina etc. and the algae attached to them offers a nestling spot for countless others. However, these shells are collected by the commercial divers far up and down the coast and brought back into Monterey fromas far south as Santa Barbara. Therefore, the exact locality from which they came is subject to a variation of several hundred mailes.

We have collected them from Punta Banda, L.C. and the coast around the point. P.M. Connolly brought back specimens of the species from far down the coast on his trip to San Quintin Bay. The exact southern end of the range is a question (Burch); Mr. E.P. Chace reports " variable in all directions. Have 3 dimention measurements of 30 specimens "; Fort Bragg Calif. (Hemphill) south to San Quintin Bay (Sternberg); Point Loma west side (Creelman); San Miguel Island, kitchen middens (Hemphill); San Nicholas Island, kitchen middens (Lowe) (San Diego Museum).

Haliotis rufescens walallensis Stearns,1900. De Poe Bay, Oregon (Burch) south to Mendocino Co., Calif. Type locality: Gualala,Mendocino Co.,Cal.

It has been the general opinion that this is a good distinct species. However, Dr. Bartsch considers it a northern race of rufescens. " Its narrower shape, less rugose surface, and smaller size differentiate it from the typical race."

Anchor Bay, Mendocino Co. (Chace). Mr. E.P. Chace comments on this species " I believe that this is a good species. If not I would place it as a variety of fulgens. The edges of the animal are not smooth and black as in rufescens but blotched in 2 shades of olive and with a pustulose surface."

Haliotis rufescens hattorii Bartsch,1940. Santa Barbara to Todos Santos Bay (Burch). Type locality: near Santa Barbara.

Collecting data: We collected specimens that seem to fit Dr. Bartsch's description in Lower California, This subspecies must be very close to the typical.

The original description follows: Proc. U.S.N.M., vol. 89, no. 3094, 1940, page 52, pl. 8, figs. 496.

" Shell small, oval, rather flat, spire depressed, with a slight auricle where the outer lip joins the preceding whorl at the summit. The color of the first half of the shell is blue, slightly variegated with red. The last half is banded with zones of red and bluish white. The sculpture consists of irregular lines of growth and indications of axial waving. The spiral sculpture consists of low, flattened threads, which are not quite so wide as the spaces that separate them. These, in combination with the incremental lines, give the ssurface a somewhat clothlike texture. The siphonal angle bears moderately elevated craters, the last four of which are open. Between the siphonal line and the edge of the aperture the shell is rounded and marked like the surface posterior to the siphonal line. The entire outer surface has a waxy appearance. The interior is pearl-gray with irridescent tints, the outer edge of the outer lip being pale reddish. The right edge of the aperture is slightly crenulated; the left edge is rather broadly expanded and flattened, sloping outward, the shelf being about the same width on the parietal wall. Muscle scar poorly differentiated.

The type, U.S.N.M. No. 535761, was collected by Mr. Hattori, an abalone diver, near Santa Barbara, for which I take pleasure in naming the form. When placed on the aperture it yields the following measurements: Height, 18 mm; greater diameter, 100 mm; lesser diameter, 74 mm.

This subspecies can be differentiated easily from typical Haliotis rufescens Swainson by its very flat shape, the very poorly elevated spiral threads, the wavy surface, and by lacking the elevated tumid area between the siphonal line and the edge of the aperture. From H. rufescens walallensis it is easily distinguished by its much broader shape and feebler sculpture. "

Haliotis ponderosa C.B. Adams,1848. Amer. Jour. Sci. and Arts, ser. 2, vol. 6, pp. 138-139.

This name has been very generally placed in the synonymy of Haliotis rufescens on the theory that the description seems to call for an exceptionally large specimen of rufescens. However, Dr. Bartsch seems to have examined the type located at Amherst College and considers it a good species. But both the locality from which it came and the possible range is unknown.

Dr. Bartsch in the paper cited above redescribed the species as follows: " Shell large, very heavy, strongly inflated, spire well elevated. The exterior is brownish red, rough, and somewhat worn. It shows irregularly developed and distributed , weakly irregularly nodulose axial ridges and very rough incremental lines, as well as indications of spiral cords. Anterior to the line of siphonal craters, the last four of which are open, the shell is moderately elevated and strongly rounded. On the early part of the last turn it has a broad, feebly developed, median tumid ridge. The dextral and parietal walls of the aperture are broadly expanded, sloping slightly inward, but not excavated.

Interior irridescent with pearly gray tint prevailing. Muscle scar large, rugose-granulose.

The type, deposited at Amherst College, yields the following measurements: Greater length, 215 mm; greater diameter, 167 mm.; height 80 mm; weight, 965 grams.

The shell appears related to Haliotis rufescens, from which the ponderous shell, well-elevated spire, and pale interior (H. rufescens has the lively irridescent-green color scheme) readily differentiate it .

It is to be regretted that Professor Adams was unable to give any information about the habitat of this abalone. I believe that it should be looked for in southern California on extremely exposed and surf beaten ledges."

Haliotis fulgens Philippi, 1845. (H. splendens Reeve, H. planilirata Reeve) Farallones Islands to the Gulf of Calif. Type locality: Not given.

Grant and Gale state " distinguished by its spiral sculpture, moderate convexity, angle at the row of holes, and keel." This is our common " blue" or " green" abalone.

Dr. Bartsch described a subspecies of ffulgens from Magdalena Bay Lower Calif.- H. fulgens turveri Bartsch, 1942 (Nautilus, Oct. 1942).

Collecting data: Our experience has been to find this a southern species from Santa Monica, Calif. becoming increasingly common in Lower California until it is seen in great numbers below Todos Santos Bay (Burch) Piedras Blancas Light House (Orcutt); Magdalena Bay (Cass); Cedros, Ascencion, San Roque Islands (Huey); Coronado Islands (Stephens) (San Diego Museum).

Haliotis corrugata Gray, 1828. Monterey, Calif. south to San Quintin Bay, L.C. Type locality: California.

Grant, and Gale state " easily distinguished by its outline and convexity, its rough surface, and tubular perforations ". This is the common named " pink" abalone.

A variety of H. corrugata, probably of doubtful validity, was described by Orcutt, Nautilus , vol. 33, p. 62, 1919- H. c. diegoensis, differing from the typical form by lacking corrugations. Type locality, La Jolla.

Mr. E.P. Chace calls attention to the fact that young specimens are very flat

Collecting data: Our experience has been to find this a southern species very common along the Palos Verdes Hills and abundant around Todos Santos Bay. P.M. Connolly brought back specimens from San Quintin Bay, L.C. No doubt the southern end of the range is still farther south. (Burch); San Pedro (Lowe) to San Quintin, L.C. (Sternberg) (San Diego M.

Haliotis kamtschatkana Jonas, 1845. Kamchatka Sea (Midd.), Sitka, Alaska to Redondo Beach, Calif. and Japan. Dr. A. Myra Keen advises " The type locality is " near Unalaska, Kamchatka Sea.".

Collecting data: Ketchikan, Alaska and Metlakatka, Alaska (G. Willett); from divers 10 miles off Yankee Point, 10 miles south of Pacific Grove (A. Sorensen); Monterey, Calif. (Lowe); Kii, Japan (coll. by S. Kinoshita); Whale Bay, Baranoff Island, Ketchikan and Craig, Pr. of Wales Island, S.E. Alaska (W.J. Eyerdam).

Haliotis aulaea Bartsch,1940, Proc. U.S.N.M. vol. 89, no. 3094, p. 53, pl. 8, figs. 1-3. Type locality: 8 to 10 fms. off Cayucos, Calif.
Range: Monterey, Calif. south to Port San Luis Obispo.

It is probable that some of the Montereyand other southern records for H. kamtschatkana are of this species. The resemblance is close.

The original description follows: " Shell of medium size and rather low, spire slightly elevated. The color scheme of the exterior is a mixture of greenand red, more or less disposed in interrupted spiral zones, producing a tapestry-like effect. Interior pearl-gray, edge of peristome variegated chiefly with green. The exterior is marked by nummerous flattened spiral cords,which vary materially in size, usually finer ones separating the broad elements. In addition there are obliquely protractively, radiating nodulose ridges, the nodules being depressed. The surface likewise has numerous incremental threads, which render the finer cords minutely nodulose and the rest lirate. The siphonal angle bears numerous craterlike projections, the last six of which are open. Anterior to the siphonal angle there is a rather strong spiral cord midway between this ridge and the basal edge of the shell. This part of the shell is also marked by spiral cords, a little finer than those on the spire, and by the continuation of the incremental elements. The aperture is broadly oval, the outer edge of the peristome is acute,while the posterior portion of the inner lip slopes materially inward. The surface of the inside is wavy and its color pearl-gray.

The type, U.S.N.M., No. 535848, was collected by A. Sorensen in 8 to 10 fms. off Cayucos, Calif. It measures: Height, 34 mm.; greater diameter, 110 mm.; lesser diameter, 85 mm.

U.S.N.M. No. 535849 contains four additional specimens, which range from a length of 53 mm. to almost the size of the type. These came from 10 to 15 fms. off the southern part of Monterey County, Calif. Two others, U.S.N.M. No. 535850, came from off Port San Luis Obispo.

This species suggests slightly Haliotis kamtschatkana but is much broader than that. It reminds one also of H. assimilis, but its coarse sculpture at once removes it from that association."

Haliotis smithsoni Bartsch,1940. Proc. U.S.N.M. vol. 89, no. 3094, pp 54-55 pl.8, figs. 7-9. Type locality: Catalina Island. Range: Santa Cruz Island to San Diego.

The original description follows: " Shell large, with a strongly mammillated spire, whose whorls are separated by a rather deeply impressed suture. From the summit to the row of siphonal apertures the whorls are almost straight, a little convex on the last portion of the last turn. The siphonal openings are craterlike, the last three or four being open. The sculpture between the summit of the whorl and the siphonal line consists of coarse incremental lines thatdevelop into inconspicuous, low, rounded ridges, which are almost regular in distribution; these ridges bear obsolete, ill-defined nodules. In addition there are slender spiral threads, which are of varying width and differ slightly in spacing. Between the siphonal line and the edge of the aperture there is a low, raised keel a little posterior to the median line. The space between this rounded keel and the siphonal line is slightly concave and marked by incremental lines and spiral threads. Anterior to this submedian line the shell is slightly rounded and marked by the continuation of the rugose radial threads referred to for the spire and spiral threads. The aperture is oval and is sharp on the dextral margin, while the left margin is moderately broad and slopingly excavated. This slope extends over the parietal wall, where it is a little broader. The muscle scar is rather pronounced. The color schme of the interior is pearly gray with irridescent, prismatic, scattered flashes. The type, U.S.N.M. No. 60425, comes from Catalina Island Placed flat onthe aperture it measures: Height, 57 mm.; greater diameter 140 mm.; lesser diameter, 107 mm. There are two additional specimens in our collection, one of which, a little smaller than the type, USNM No. 98329, collected by Dr. Cooper at Santa Cruz Island, measures: Height, 50 mm. greater diameter 119 mm.; lesser diameter, 94 mm. The other, USNM No. 11808 a very large specimen, bears the locality label San Diego, which I somewhat question. This measures: Height, 77 mm.; greater diameter, 193 mm.; lesser diameter, 148 mm. This species suggests Haliotis kamtschatkana. Its gigantic size and comparatively feebler sculpture will readily distinguish it from that. I take pleasure in naming it for the founder of the Smithsonian Institution, James Smithson."

Haliotis assimilis Dall,1878. Farallones Islands to San Diego, Calif, in deep water. Type locality: California.

A strongly inflated oval species.

Collecting data: We have dredged numbers of specimens of what we identify as this species from off Redondo Beach usually in 25 fathoms or slightly deeper. The same thing from off El Segundo in 35 fms. We brought up one lot from about 50 fms. on the north side of the submarine canyon off Redondo. There is some question in my mind thought whether or not these are identical with the large shells we have identified as this species from off Monterey. (Burch); by diver from 10 fms. off Yankee Point, 10 miles south of Pacific Grove (A. Sorensen); Pt. Conception, Calif. (Lowe); Redondo from 50 fms. (Lowe); San Diego (Gripp); Coronado (Orcutt) (San Diego Museum).

Haliotis sorenseni Bartsch,1940. Proc. U.S.N.M. vol. 89, no. 3094, p. 53, pl. 8, figs. 1-3. Type locality, south of Point Conception,Calif. in 10 fathoms.

Range: Point Conception, Calif. south to West Mexico.

Collecting data: Many os us had this large species in our collections labelled H. assimilis before Dr. Bartsch described it. It is my opinion that it is a good species but in outward appearance it is very close to H. assimilis. The late Dr. Fred Baker had numbers of fine specimens from Lower California. We brought up one fine specimen from about 6 fathoms off Malaga Cove, L.A. Co. Mr. H. Ralph, since deceased was the diver. One amusing thing occured with this species. After the description of H. sorenseni there was quite a demand for it by the local collectors and members of the club. Mr. Naylor of San Diego who imported abalone shell for commercial purposes had several burlaped bales of this species imported from Mexico along with large numbers of fulgens, but finding the shells of sorenseni too thin to polish for souvenirs he sold the lot to a mill to grind them up into gravel for chicken feed. We could have done much better selling the shells had he known what he had. (Burch); San Martin Island (cass); Cedros Island (Naylor).

The original description follows: " Shell large, thin, the exterior brownish red, decidedly inflated, spire well elevated. Between the line of strongly elevated craterlike siphonal perforations, of which the last four or five are open, and the edge of the shell the upper three-fourths is gently rounded, while the outer quarter flares to a considerable expansion, which produces a decided, concavo line at the inner edge of the outer fourth of this part of the shell. The outer surface is marked by more or less regular, broad, low, axial ridges, which bear irregularly developed, not strongly pronounced, nodules. The outside is further provided with numerous closely placed, slender, spiral cords that vary materially in strength and with numerous closely spaced, incremental lines that almost equal the spiral cords in strength. In addition to this sculpture, broad, low, elevated, axial areas, which are feebly nodulose, alternate with depressed zones. The interior of the shell is irridescent with a pinkish pearly hue prevailing, and bright rosy tints mark the outer half, while within, scattered greenish areas of irregular size and distribution are present. The muscle scar, usually strongly marked in *Haliotis*, is here but feebly impressed, in which character it resembles the other California deep-water species, *Haliotis assimilis*. It resembles that form also in the excavated inward sloping of the expanded dextral margin of the aperture and the sealing-wax colored edging of the peristome, but differs materially in size and in the color of the interior.

The type, USNM No. 535688, resting upon the aperture, yields the following measurements: Greater length, 218 mm.; greater diameter, 168 mm; height, 81 mm. It weighs 448 grams.

Two paratypes in Mr. Sorenson's collection yield the following measurements, respectively: Greater length, 300, 210 mm.; grater diameter 149, 172 mm.; greater height, 79, 65 mm.; weight, 370, 465 grams. Of these specimens Mr. Sorenson writes: " They were found slightly south of Point Conception, Calif. by a commercial abalone diver, in 10 fathoms depth. After one was found dilligent search for two weeks succeeded in finding only three more. No other diver found any; the time was about September, 1939." A subsequent letter states: " The animal was colored yellowish with dark specks, and the meat was quite tender."

Family Fissurellidae

We have no references to papers on this family from the West Coast but, the Atlantic species have been very thoroughly worked by Isabel Perez Farfante in Johnsonia #10, August,1943 and continued in Johnsonia #18, 1945.

Genus *Fissurella* Lamarck,1799. Type (by monotypy), *Fissurella nimbosa* Linne,1758.

" Shell conical, elevated, depressed and even flattened, variable in size, with the apex subcentral. Orifice at the summit or anterior to it, variable in shape. Surface in a few species smooth, in others with shallow grooves, but generally with numerous radiating ribs which frequently possess small or large nodules or erect scales. Concentric growthlines are always more or less visible. Margin simple, crenulated or notched. Muscle impression continuous but formed as two parts, the larger horshoe-shaped with the extremities enlarged and connected by a smaller and narrower band or scar. The orifice is bounded inside by a callus which is not truncated or excavated. Shell wholly external, capable of containing the soft parts." Johnsonia #10, pp. 1-2.

Subgenus *Balboaina* Perez Farfante,1943. Type (by original designation) *Fissurella picta* Gmelin.

" Shell generally large, certain species reaching a length of 100 mm.

(con.)

heavy and broadly conical. Orifice a little in front of the middle. Outer surface smooth, with numerous radiating striae or ribs more or less nodulose. Margin of the shell entirely in one plane, simple not crenulated and with a dark and generally broad, interior border. Internal callus of the orifice usually broad." Johnsonia #10, p. 2, 1943.

Fissurella virescens Sowerby,1835. Proc. Zool. Soc. for 1834, pt. 11, p. 125. San Pedro, California to Peru.

Mr. A.M. Strong advises that there is a good record of this species from San Pedro by Dr. Tremper.

Dr. A. Myra Keen sends a copy of the original description which follows: " Fiss. testa ovata, elevatiuscula, radiatim costata et striata; intus virescente, margine pallidiore, undulato et crenulato; extus pallide virescente fusco-virescente obscure radiata, margine costellis crenato; apertura dorsali oblonga, extus utrinque coarctata: long. 1.8, lat. 1.4 poll. Hab. as Panamam. Found in exposed situations at low water."

Collecting data: Tres Marias Islands, Mexico(Lowe); Galapagos Islands (Calif. Acad. Sci.); Mazatlan (Forrer) (Lowe); San Juan del Sur, Nicaragua (Lowe).

Fissurella volcano Reeve,1849. Crescent City, Calif. to Panama. Type locality: Santa Barbara, Calif.

Collecting data: One of our common species to be found on almost any rocky rubble the length of the California coast and on down the coast to the south. There are some odd races of this species and it is a wonder more of them have not been named. There is a large colony on the San Pedro breakwater distinguished by what seems to be corrosion on the inside of the shells. Specimens from Cayucos, San Luis Obispo Co. seem to be both of exceptional size and oddly shaped.

A subspecies Fissurella volcano crufifera Dall,1908 is a color form with radial white bands. The general opinion is that this is of no significance whatever. Color patterns in this species could be given a list of names too long to find names for them.

Genus Megathura Pilsbry,1890 Type (by monotypy), Megathura californica Nuttall MS * Megathura crenulata (Sowerby).

Our species of this genus has been placed under the following generic names; Lucapina Gray,1857 by Tryon, Arnold and early Keep. Macrochasma Dall,1915. It is strange that Grant and Gale did not even mention or discuss Dr. Dall's lengthy discussion in his paper in 1915 " On some Generic Names mentioned in the " Conchological Illustrations". But it is also odd that Dr. Dall made no mention of Pilsbry's Megathura 1890 when he proposed the name Macrochasma Dall,1915.

Megathura crenulata (Sowerby),1825. Monterey Bay, Calif. to Cedros Island, L.C. Type locality: not given.

Collecting data: This large species with the shell almost internal and far too small for the animal is amazingly common at seasons. It has been called Chinese abalone but I wonder how they could eat them. We tried it once and found them somewhat tougher than shoe leather. Certain localities seem to abound with this species. The Santa Monica breakwater usually will produce as many as you care to toss in your row boat but this is perhaps because this breakwater is only reached by water and therefore protected from the host of beach collectors. Also common at San Pedro,San Onofre, Balboa etc. (Burch).San Geronimo Island, L.C. (Lowe).

Genus *Lucapinella* Pilsbry,1890. Type (by original designation), *Clypidella callomarginata* Carpenter.

" Shell depressed conical, rather small, with the apex subcentral and completely occupied by the large orifice. The shell is sculptured with irregular radial ribs, crossed by laminae which form small scales. Margin thickened, so much so that in adult specimens the crenulations are blunted. In general it rests on a plane but sometimes its posterior end is slightly raided. Internal callus of the orifice narrow, its posterior extremity roundly truncated. Muscle impression of a uniformly narrow width." Johnsonia 10:18-19.

Lucapinella callomarginata(Dall)1871. Bodega Bay, Calif. south to San Juan del Sur, Nicaragua (Lowe). Type locality: not given.

Collecting data: The animal is far too large to be contained in the shell which is almost internal. Our experience has been to find this species comparatively rare with localities from Monterey, Cayucos, Morro, Newport Bay, Bird Rock, Mission Bay, Punta Banda, Arbolitos,L.C. (Burch); Anaheim Bay in the old oyster beds (Chace); Alamitos Bay (Lowe); Anaheim Bay (Lowe); San Diego, Calif. (Hemphill); Mission Bay (Lowe); San Jauan del Sur, Nicaragua)(Lowe).

Genus *Megatebennus* Pilsbry,1890. Type (by original designation), *Fissurellidea bimaculata* Dall.

" Edges of shell elevated at each end, blunt at the sides, in adults not crenulated." (Pilsbry). Grant and Gale state " *Lucapina* Gray differs in that the edges of the shell are nearly in a plane, are finely crenulated and are not elevated at the ends."

Megatebennus bimaculatus (Dall),1871. Forrester Island, Alaska to Tres Marias Islands, Mexico (Strong and Hanna). Type locality: Dr. A.M. Keen advises " Not selected; by implication, Monterey, Calif.

Collecting data: One of the interesting things about this species is the variation in the color of the animals. We took them in large numbers at Cayucos, San Luis Obispo Co. and found that we had three entirely different colored animals, deep red, deep yellow and white. Study of the animals at the university showed absolutely no difference other than the color, and of course, the shells were identical. This experience has caused me to place a little less emphasis on the color of the animals of some of the species. This is a littoral or shallow water species. It is common under stones the length of the coast, but our deepest dredging records show 15 fms. off both Montereyand Redondo Beach, Calif. (Burch); Crescent City, Calif. (Chace) to La Jolla (Bristol) (San Diego Museum).

Genus *Diodora* Gray,1821. Type (by monotypy), *Patella apertura* Montagu = (*Diodora graeca* Linne).

This generic name is frequently incorrectly spelled *Diadora* instead of Diodora.

" Shell conical, elevated or depressed, the size varying between wide limits. Apex in front of the shell center: in young specimens curved and slightly twisted, inclined backward and with a fissure in fron of it. In the adult, this small and slightly twisted portion is totally lacking. Orifice at the summit or immediately anterior to it, variable in shape. Surface of the shell sculptured by conspicuous radiating ribs and concentric threads or laminae. Basal margin of the shell resting upon a plane or slightly elevated in the middle part of the sides; never raised at the ends. Margin strongly crenulated. Muscle impression frequently indistinct, but when distinct, not uniform in width and with the anterior part incurved at the ends. A few species have the muscle scar completely oval and of a uniform width. A small and narrow connecting ridge bridges the area between the incurved ends. The orifice is bounded by a callus which is truncated posteriorly and sometimes excavated at this region forming a deep pit. Shell completely external, not covered by the mantle and capable of containing all of the soft parts." Johnsonia 11:1.

/ San Juan del Sur,Nicaragua(Lowe)
Diodora aspera (Eschscholtz),1833. Cook's Inlet, Alaska to Magdalena Bay, L.C. Type locality: Dr. A.M. Keen advises is "Norfolksund bei Sitka."

Perhaps the most common agrument in connection with this species is the subspecies denisclathrata (Reeve),1850. Grantand Gale,1931, p. 850 place the subspecies denisclathrata in the synonymy of the typical. However this is by no means accepted by all. I have personally never seen a specimen so labelled nor have I recognized a specimen of this variety. It is described as having subequal, nodulous ribs, and theseare characters I have never seen on a specimen of aspera. The range is given by Dall as Monterey south to San Quintin Bay and Socorro Island. An interesting item is that the San Diego Museum of Natural History have numerous sets in the Lowe collection labelled D. aspera denisclathrara Rve. as follows: La Jolla (Galloway); San Pedro; Mission Bay; Guaymas,Sonora; Mazatlan; Cape San Lucas; Manzanillo; San Juan del Sur, Nicaragua (Lowe). In any event the Nicaragua record is an extension of range southward. Dr. W.O. Gregg states " I consider denisclathrata a synonym of D. aspera." The consensus of opinion seems to be that denisclathrata is either a subspecies of questionable validity or a synonym.

Collecting data: In our experience this is a comparatively common species littoral in about the same habitat as Fissurella in the northern part of the range but more common if not confined to deeper water in the south. It is easily found exposed on stones from Puget Sound south to Cayucos in our experience- from Crecent City,Monterey,Cayucos, littoral. We found it a shallow water species in the dredgings off Monterey not deeper than 15 fms. or perhaps 20 fms. at most. This bathymetric range seems to be fairly constant southward to Todos Santos Bay, L.C. where we dredged it in 15 fms. It was rather common on kelp holdfasts washed ashore in southern California from Los Angeles to San Diego, Imperial Beach etc. Not uncommon in the Pleistocene of Timm's Point, San Pedro. (Burch); " In march,1922, I found a nice set of Diodora aspera on the breakwater at Fish Harbor, San Pedro." (W.O. Gregg).

/ to Tres Marias (Srearns).
Diodora murina Arnold,1903. Crescent City, Calif. south to Magdalena Bay, L.C. Type locality: not known.

Dr. A. Myra Keen comments on this species as follows: " There is a real problem in connection with this name. The first usage is clearly a nomen nudum (Dall, Proc. U.S.N.M. vol. 8, 1885, p. 543) "Fissurella (Glyphis) murina Cpr. Not common. San Diego. This is the Glyphis denisclathrata of Californian conchologists, and for a time of Carpenter but not of Reeve." Incidentally, Grant and Gale cite this reference as " Carpenter in Dall in Orcutt." But however one cites it it still is a nomen nudum. Article 25 of the International Rules requires for a species an indivation, a definition, or a description. Obviously the latter two are lacking, and an indication is defined in Opinion 1 as: a bibliogra-phic reference , or a published figure, or a definite citation of an earlier name for which a new name is proposed. Dall's usage does not conform to any of these since he ~~says~~ in effect cites only misidentified specimens. The later citation copied by Mrs. Oldroyd is no better. So far as I can find , the first valid usage is by Arnold,1903 (Mem. Calif. Acad. Sci., vol. 3, p. 339), where there is a brief description. The first figure of the species would be also by Arnold, Proc. U.S. Nat. Mus. vol. 32, pl. 50, fig. 3,3a, the specimen being a fossil probably of Pleistocene age. Until someone selects a lectotype from among Arnold's material, most of which is here at Stanford, the type locality of this species is undetermined. If the Williamson collection is extant, one could select one of the Catalina specimens,as Arnold cites that record,"

Collecting data: Our experience has been to find this species not littoral but confined to comparatively shallow water. We dredged it in 20 fms. off Monterey in considerable numbers ; 15 fms. off Pacific Grove 35 fms. off El Segundo; 25 fms. off Redondo Beach; 25 fms. off Avalon, Catalina Island; and occasionally taken from kelp holdfasts from Los Angeles to San Diego county. (Burch); San Diego (Hemphill); La Jolla and Long Beach and San Nicholas Island (Lowe) (San Diego Museum)

* Additional data for Diodora aspera Eschscholtz- by W.J. Eyerdam
" San Juan Islands, Port Orchard, Kitsap Co., Rosario Beach, Skagit Co., Challam Bay, Challam Co., Wash.; Port Armstrong, Baranof Island, S.E. Alaska. About 2 dozen specimens were collected on underside of stones at Rosario Beach. Each one of them had a polynoid commensal worm called Halosydna lordi Baird nestling under the mantle."

Diodora inaequalis (Sowerby),1835. ??? Santa Barbara, Calif. south to Mantua, Ecuador and the Galapagos Islands. Dr. A. Myra Keen advises " The type loc. of D. inaequalis is " Guacomayo and Galapagos Islands. ."

This species is questionably a member of the California fauna. We have it from many localities down the west coast of Mexico, Guaymas, Punta Penasco etc. The only specimens reported from California are from the San Diego Museum by Miss Bristol " From many points from Lower Calif, to Panama- 2 specimens from Imperial Beach, Calif. found by Mrs. Kate Stephens."

Genus Puncturella Lowe,1827. Type (by original designation) (fide Woodring), Patella noachina Linnaeus.

A number of subgenera have been described. Grant and Gale state " In the typical section of Puncturella the apex is not absorbed by the perforation. In Section Fissurisepta Sequenza the apex is absorbed by the anal perforation. In Section Cranopsis Adams , the fissure is on the front slope instead of at the summit."

Puncturella major Dall,1891. Pribilof Islands, Bering Sea and southward to Dixon Entrance, Alaska. (Dall). south to San Juan Islands, Puget Sound (Eyerdam). Type locality, Albatross Station 3262, off coast of Akutan Island, Bering Sea in 43 fathoms.

Puncturella galeata (Gould),1848. Unalaska, Aleutian Islands, south to Redondo Beach, Calif. (Burch) . Type locality: Dr. A.M. Keen advises " The type locality of Puncturella galeata is Oregon according to the holotype label."

Collecting data: Dredged off Redondo Beach, Calif. in 50 fms.; off El Segundo, 5 mi, N. in 35 fms. (Burch); Drier Bay, Knight Island in 10 fms. mud; Izhut Bay, Afognak Island; Raspberry Island, Alaska- dredged (by W.J. Eyerdam); Hinchinbrook Island, Alaska (Norberg) (Eyerdam); San Juan Islands, Puget Sound (Oldroyd); Drier Bay, Knight Island, Alaska from 20 fms. (Brown) (San Diego Museum).

Puncturella eyerdami Dall,1924. Naurilus, vol. 37:133 (not figured). Range: Drier Bay, Knight Island, Pr. Wm. Sound, Alaska.

Collecting data: Collected by W.J. Eyerdam in 1923, in mud bottom, in 25 fathoms.

Puncturella cucullata (Gould),1848. Kodiak Island, Alaska to La Paz, L.C. Type locality: Puget Sound.

Dr. Kenn advises that the correct date of these Gould descriptions is 1848 instead of 1846as given in Bull. 112 and other works.

Grant and Gale state: " Puncturella cucullata (Gould) has sixteen prominent widely spaced, primary radiating ribs with subdued secondary ribs between. In Puncturella multistriata Dall the middle one of these secondary ribs is emphasized, giving the sculptural aspect of the shell a very different appearance. In Puncturella major Dall these middle secondary ribs are as strong as the primaries, giving the shell twice as many primary radiating ribs as cucullata. Mr. George Willett, of the Los Angeles Museum staff, has a series of Recent specimens of this species but they do not seem to intergrade and he is of the opinion that they are distinct species at least in the Recent fauna."

Puncturella cucullata attains a larger size in Alaskan waters than it does in southern California. Mr. Willett has Alaskan specimens that measure over 30 mm. in longer basal diameter whereas Catalina Island individuals rarely measure over 18 or 20 mm. In the north it occurs at low tide line but in southern California it is obtained only by dredging ."

Collecting data: Dredged in 20 to 40 fathoms off Monterey, Calif.: Redondo Beach in 25, 50 and 75 fms.; off El Segundo in 35 fms.; common in the Pleistocene of San Pedro, (Burch); Catalina Island in 35 fms. (Lowe); Forrester Island, Alaska (Willett); Puget Sound (Randolph) (San Diego Museum); Sawmill Bay, Evans Island,; Drier Bay, Pr. Wm. Snd.; Izhut Bay, Afognak Island and Raspberry Island, Alaska (Eyerdam); dredged on mud bottom; Hinchinbrook Island (Norberg) (Eyerdam).

Puncturella multistriata Dall,1914. Atka Island, Aleutians, south to San Diego and Cortez Bank, Calif. Type locality : Dr. A.M. Keen advises " The type locality of P. multistriata is Station 2466, Strait of Fuca, 56 fms., according to the holotype label."

Collecting data: Dredged off San Juan Islands, Puget Sound in 50 fms. (Miss Ruth E. Coats); Seymour Narrows, B.C.; Izhut Bay, Afognak Island, Alaska; San Juan Islands, Wash. (W.J. Eyerdam); Hinchinbrook Island (Norberg) (Eyerdam).

Puncturella longifissa Dall,1914. Bering Island, Bering Sea.

Puncturella cooperi Carpenter,1864. Kasaan Bay, Alaska to San Diego in 50 fms. (Kelsey). Type locality: Dr. A.M. Keen advises Catalina Island according to the holotype label.

Collecting data: Dredged off Rodondo Beach in 25 to 75 fms.; common in the Pleistocene of Timm's Point, San Pedro. (Burch).; Catalina Island in 35 fms. (Lowe); Forrester Island (Willett) (San Diego Museum).

Puncturella delosi Arnold,1907. (P. caryophyla Dall,1914.) Off Point Vincente, Calif. in 12 fms. (Gregg) south to off San Diego, Calif. in 67 to 81 fms. Type locality : Bath House Beach, Santa Barbara (Pleistocene)

Dr. A. Myra Keen advises on this species as follows: " Dr. Woodring believes that P. caryophylla is a synonym of P. delosi Arnold,1907 , Smith. Misc. Coll., vol. 50, 1907, p. 439, pl. 57, fig. 5 a-b. "

The only report on this species is from Dr. W.O. Gregg " From the dredgings in 12 fms. off Pt. Vincente I have a single specimen which Mr. Willett and I decided was P. caryophylla Dall. If the identification is correct that is another extension."

Genus Hemitoma Swainson,1840. Type (by monotypy), H. tricostata (Sowerby) = ? Patella octoradiata Gmelin.

It had been our impression that Subemarginula was in the synonymy of Hemitoma . It may be but Dr. A.M. Keen indicates that there is still a question involved, " Patella octoradiata is the genotype of Subemarginula so that apparently the latter is a synonym of Hemitoma, provided octoradiata proves identical with tricostata Sowerby."

Hemitoma bella (Gabb),1865. Forrester Island , Alaska south to San Diego, Calif. (Gripp). Type locality: Monterey, Calif.

The consensus of opinion is that H. yatesii Dall,1901 is identical with this species and should be placed in the synonymy of the typical.

Collecting data: Our experience has been to consider this a very rare species. We have dredged two large specimens from 20 fms. off Monterey, Calif. (Burch); 1 specimen dredged off San Diego (Lowe Collection).

Dr. A.M. Keen notes " The holotype of Hemitoma bella is in the paleontological type collection at the University of California.

Hemitoma golischae (Dall),1916. Type locality: San Nicholas Island, Calif.

Grant and Gale state that this is an extreme instance of Fissurella volcano Reeve having developed an entirely imperforate apex. We have similar specimens as well as others with the apex almost closed. (Burch); Mr. E.P. Chace reports as follows: " I examined the type at two different times. It was collected by the Golisches and I saw it and called it imperforate Fissurella before it was sent to Dr. Dall. Several years later when the Golisch collection was in the Southwest Museum, I had the case opened and again studied the specimen and found no reason to change my mind. "

Minutes of the Conchological Club of Southern Calif.- Feb.,1946 meeting

The Conchological Club of Southern California met tuesday evening, Feb. 5,1946 in the lecture room of the Children's Hall at the Los Angeles M Museum. The meeting was called to order by the president Dr. W.O. Gregg and there were 16 members present, two of the older ones back after a considerable absence were Bill Reeder and Albert Bauman and it was good to have them with us again.

Two new publications were reported " Fishes and Shells of the Pacific World" by Nichols and Bartsch, Mc.Millan $2.50 and " Wonders of the Sea" by Shelley, Iris Press $3.00.

Communications were read from H. Carroll McGowan whose address is R.1. Box 73A, 4277 Hollister Ave., Santa Barbara, Calif. who sent greetings to the club and the following request for stamps " I can make very good use of any stamps and revenues you might be able to send me, especially commemoratives, air mail, and the higher value postage. Have lost out on some of the recent commons."

A letter from A. Sorenson tells of an interesting stay of part of October and all of November at Guaymas, Mex. at the Miramar Beach Hotel with the happy combination of delicious sea food and interesting collecting. He had such a good time, in fact, that he threatens to go back for another month or more.

A letter from F.R. Aldrich of Balboa, witha greeting to the club and a record of some good hauls in that vicinity such as 55 Solen rosaceus and 1212 Diplodonta orvella, the most he had ever taken at one time.

An account of his experiences in collecting at Surf while he wqs still in the army was given by Albery Bauman. From his description it would seem to be a rather easily accessible place and he made a few very good finds.

The regular study was then taken up with Mr. E.P. Chace as leader and notes were taken from the discussions and will be found elsewhere in yho minutes. The subject mattwr was interestingand continued well up to closing time when the meeting was duly adjourned.

Effie M. Clark, Secretary.

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E.J. Bromell, P.O. Box 708, Winnemucca, Nevada. We are happy to welcome Mr. Bromell to our shell circle.

Fred Jeffers, Kalama, Washington. Is interested in purchasing shells.

Professor T.D.A. Cockerell, 908 10th, Boulder, Colo. Advises that they will not return to Palm Springs next winter and are considering Mexico, South Africa and the West Indies. The editor would be pleased to be able to go along to any of them.

Mrs. Edward M. Johnson, Box 444, Falmouth, Mass. has been spending the winter at 410 Dixie Parkway, Fort Myers, Florida.

Dr. B.R. Bales is now much better, out and around again.

Dr. F.M. MacFarland, 775 Santa Ynez St., Stanford University, Calif. " I have been quite busy closing things up at the Academy making way for my successor in the presidency. After 12 years of it the Academy deserves a change- and my desk and files a complete cleaning out. Now I am packing up for a couple of months collecting and study in the Newport-San Diego region. During march Mrs. Mac Farland and I expect to be at the Scripps Institution of Oceanography at La Jolla- and in april along the coast at La Laguna and Corona-del-Mar principally. ..."

Mr. Robert H. Moses, 42 Pembury Road, Tottenham, London N. 17, England. " ... During the war I have lost my correspondent who supplied me with S. African shells, also the man from western France. Conchology seems almost dead in England. We have been unable to get to our coasts for the last 6 years and also we are all getting older and less able to rough it. I wish you and the club all kinds of good luck for the future."

Mr. R. Winckworth, 71 Whitworth Road, London SE 25, England.

The following correction of our conclusions is greatly appreciated. We are accepting the advice and changing our labels accordingly. Members are advised to change the copy to conform to the following data.

" I was delighted to get your generous gift of so many numbers of the Minutes of the Conchological Club of Southern California as well as the book on Pelecypoda and the Glossary. I forsee much interesting reading on spare evenings.

The only point I should like to raise is on Pedalion , which cannot be regarded as a valid generic name as used by Huddesford in his edition of Lister, published in 1770. The full quotation is:

Index .... juxta methodium ... Linne'	English Names
.	.
.	.
Ostrea	Oister
.	.
.	.
30 Isognum	30 Pedalion Rudder Solander

Iredale who first drew attention to the existence of the name Pedalion as a matter of historical interest does not use or recognize the name as valid. In the Great Barrier Reef Sci. Rep. (Mollusca 1) 5 ,319 (1939) under Isognomon he gives :

1786 Isognomon Solander, Cat. Portt. Mus. pp. 9,41,52,115,137. Tautotype: L.lignea * Ostrea isognomon Linne' . Also spelt Isognoma (on pp 9,115,137).

... Prashad points out that there is no justification for his (I males) lat r suggestion that Pedalion (Solander) Huddesford should replace Isognomon . I did not suggest this."

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Dr. F. Haas, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois.

We are flattered by the generous letter from Dr. Haas and appreciate the information on the Norrisia .

" Yesterday, No. 57 of the Minutes of the Conchological Club of Southern California was received and is appreciated as all the other numbers have been. I have decided to stop all my- only occasional- study of West coast forms until the critical list with classification keys, as it is started and carried forth to a great extent in the " Minutes" will be finished; that will save me much trouble of going into the literature for details. You certainly did and are still rendering an important service to all shell people who have to do with West coast shells.

I hope you will not mind a short note concerning the comment of my good and kind friend, Dr. Joshua L. Baily, on the nucleus of Norrisia norrisii (No. 57, p. 34). It so happened that a few years ago, I studied the spiral whorls of Norrisia and I found them dextral, as all the rest of the shell, and provided, furthermore, with a spiral sculpture which is lacking to the later whorls. For reference see: Zool. Ser. Field Mus. Nat. Hist. 24, p. 170, pl.2, fig.g, 1941 (- Malacological Notes,II). I am almost sure that I sent you a copy of this publication!..."

Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa.

" .... I have just returned from leave and have brought back a very valuable series of Patella which I hope to be describing soon. No new species but most interesting gradations in form within the species."

We are pleased to send Mr. Koch a file of all of our available Issues as requested.

We are in receipt of the following interesting letter from the Philippines. It is addressed to the Editor, Conchological Club of Southern California (Through the office of the President of the Philippines, Manila).

Sir:

At the outbreak of World War II, the Scientific Library of the Bureau of Science, an office under this department , had one of the largest and best known collections of technical and scientific publications in this part of the Orient. This same library was destroyed by the Japanese during the war.

We shall appreciate it, therefore, if you will help us in the task of building anew from scratch some such collection by donating to the library whatever publications you can spare now and in the future. Please send them addressed to: Scientific Library, Bureau of Science, Manila, Philippines. Very respectfully, Jose S. Camus, Under Secretary. "

We have mailed them a complete file of all of our available publications. Members in possession of duplicate publications could scarcely find a more deserving place to send them,

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Wm. L. Kelley, 120 Chandler St., Worcester, Mass. Is interested in buying shells.

Mrs. R. Turtado, Kellog Creek, Byron RD.,Calif. Asks to buy shells.

Mrs. Godfrey Yaeger, 7500 N. Keystone Ave., Indianapolis 44, Indiana. Is interested in buying shells in connection with Girl Scout work.

Harold N. Vars, Rt. 2, Westerly, R.I. Asks about buying shells.

D. Thaanum, 43 Coelho Way, Honolulu, Hawaii. We were happy to have a Happy New Year from Mr. Thaanum, know that he is well and of course, thank him for his generous contribution to our publishing fund.

Roy L. Morrison, 3745 Grim Ave., Sah Diego 4, Calif. " Enclosed find check for shell minutes. Havent beenable to take in any of the low tides this winter. Hope to get in on some in March."

Mr. and Mrs. Charles H. Lonegrove, c/o General Delivery, Wayneshow, Va. Inquire about purchasing shells.

Glenn R. Webb, Ohio, Illinois. We were glad to have a nice letter from Glenn and join him in his " Here's hoping I may meet youa nd others of my California conchological friends at the Amer. Malacological Union meetings which are being planned this year. It has been a long time since my short stay at Los Angeles."

Wray Harris, Bishop Museum, Honolulu 35, T. Hawaii/ This is the correct address. In some way we published Honolulu 10 instead of 35.

Captain C.M. Dumbauld, U.S. Naval Hospital, Balboa, Canal Zone, Box 45, Navy 121, c/o F.P.O., New York. " The back copies of your Minutes arrived several days ago and I have difficulty tearing myself away from them. I find the condensed keys from A.M. Strong's notebook particularly useful. Could you tell me if this notebook has ever been published or if publication is contemplated? The shell language is for the most part new to me and I find some of the descriptive terms difficult to apply. Has a glossary of terms used in shell descriptions ever been published ? I find the one in Sea Beach at Ebb Tide much too brief. ..."

By this time you will all have our illustrated glossary of terms for the Pelecypoda. We expect to publish a similar work covering the terms for all other groups. And incidentally we wish to perfect it by adding in these minutes other terms which may have been ommited. Please write in advising us of needed additions. Mr. Strong's notebook has never been published but his work is being published regularly in several established journals.

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An addition or correction should be noted on our report on the Phasian-

Eulithidium are being recognized as full genera.

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Minutes of the Conchological Club- March meeting

The Conchological Club of Southern California met in the Directors Room of the Los Angeles Co. Museum, March 5, 1946, at the usual hour. This change of meeting place was for the one time only due to another meeting which this smaller room would not accomodate.

The meeting was called to order by the President, Dr. W.O. Gregg. There were 14 members present , two of them, Mr.and Mrs. E. Cameron, having been long absent were most welcome. There were no standing committee reports and but one communication- from Mr. E.J. Post of Tampa, Fla who told of failing health and inability to do much collecting. For members who may wish to write him, his address is R. 6, Box 283. Attention was called to the meeting of the Pacific Shell Club held on the third sunday of each month at 2:30 P.M. in the Directors Room of the Museum.

The lesson, this time on Calliostoma and Margarita had so much of interest to discuss that there was not time to complete it before the closing hour and it will be taken up again at the next meeting. The comments of members will appear in the minutes at a later date. Mr. Chace led most ably in these discussions. The meeting was duly adjourned.

Effie M. Clark, Secretary.

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George P. Kankoff, Curatorical Asst. in Paleontology, Los Angeles County Museum, Exposition Park, Los Angeles 7, Calif.

" It has been more than three months since I finished with the war work and returned to the museum. Those thirty months were very uninteresting and the shells I worked on were all alike- 155 mm. ... Since I have returned to my work , I have been working on Rancho La Brea material with Dr. Pierce; washing the material in benzol, sifting it and sorting it by a different method with the result that we have a long series of tiny bones in thousands, amphibian, reptilian elements and bird material in such abundance that it will take several specialists years to study it. Dr. Pierce has so far separated 125 species of insects and a few new ones.

In my department (Invertebrate Paleontology) I am straightening out collections in chronological order and working about three hours a day on Newport Esturary material. As you probably know, Mr. Willett completed a brief description of the three localities on the Irvine Estate. It was his desire that I should get more of that material. It is the warmest of all the San Pedro series. I became very excited when Mr. Grouard of Santa Ana brought us Phyllonotus radix nigritus. A group of us, accompanied by Mrs. Clark and Miss Cook, were taken there by the Marsch family, and Mr. Grouard and Mr. Sprague showed us the places where they found a new Turbonilla and the Phyllonotus. When three hundred pounds of the material had been sorted Mr. Willett became very interested. This material has such an unusual proportion of species (about 10 new species of mollusca, bryozoan and crustacean) that at a glance it differs from any other San Pedro deposit. This was in 1940. In November,1942, Mr. Willett, Dr. Chester Stock, and I , visited this locality and brought back an additional 75 poinds of siftings from the southern locality. Then the war broke out and I had to take a leave of absence from the Museum in order. Now I have gone through two tons of material and have many more records. I am writing all this to you not only to get it off my chest, but also to let you know that as far as the Paleontology Department is concerned, the war is over. We have a great amount of the most valuable material and it will be at the service of all at any time, especially when I shall have completed weeding out and arranging the collections by periods. (con.)

It left me broken hearted when I read in the Minutes that Mrs. Clark is intending to send her fossil material to the U.S. National Museum. Did she forget about our museum ? I want to take this opportunity to remind our club members that business is now going on as usual ; that we have wonderful matwrial like Playa del Rey, Capistrano, Outfall Sewer Material, Lumberyward and many other collections containing thousands of perfect specimens with Mr. Willett's identifications. Lately we boosted up our Cretaceous material by adding tha t of Trabuco, Modjesca and Santiago Canyons. We have an abundance of fossil fish matwrial; and out paleobotany collection has doubled in three years. The less complete collections are Hilltop Quarry and Timm's Point. Perhaps some of the members have some siftings from those localities left. They would be of the greatest help. I will be happy to show you our latest achievements if it will be possible for you to come to the museum......"

Beatrice Hodge, " Spindrift", 1663 North Atlantic Boulevard, R.R. 2, Fort Lauderdale, Florida. We are happy to add Miss Hodge to our shell circle. " My aunt is an invalid and she is most interested in our shell collection. We now have shells from all over the world. Have you any unusual chitons, Pectens, Spondylus, Acmaea, Fissurellas or Abalones for sale ? Also we are much interested in Cypraea. I am going collecting on the Keys in the spring and hope to find some rare specimens of Pectens."

Harold Harry, R 2, Box 222, Shreveport, Louisiana. " ... I have been at home less than a week, during which time I rushed madly into the task (rather pleasure) of unpacking. Things in that line are really in hand. Of the shells I managed to bring home alive, only the Pythia and Truncatella of Ulitii and one Cyclophorus of Io Shisma survived. One Pythia from Samar, P.I. will have been in captivity one year on Feb. 21 and under very adwrse conditions. They are sluggish now, as our temperature ranges from 40 to 80 degrees and the house is poorly heated. Managed to add some Bradybaena and Ruminia to the little zoo while in New Orleans. But Ruminia is carniverous and must be segregated. Have letters from Dr. Gregg, Miss Shepard, and Glenn Webb which demand attention as well as many loads in " Min. of C.C.S.C." Would you believe it I spent no less than 8 hours last evening doing nothing but reading the Minutes. Finished the first half of them. I found it literally useless to try and wade into all the boxes of material I have until I had first gone over the Minutes again. In about a week I'll have something to write about. Hope you are all well. Civilian life is very close to what heaven must be like (at least so far, I hasten to add.)"

" During the second voyage I was pleased to correspond with Dr. C. Montague Cooke, of B.P.P. Museum and have duplicates of some land shells from the pacific islands which were the subject of our letter writing."

" During the spring I shall be at home, and shall devote the greater part of my time to conchology. Will probably return to school in the fall- but of all that I shall write later. Anyhow, greetings to you one and all. Sorry not to see you before going home, "

Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand. We are pleased to have a nice letter from our New Zealand friend and wish herewith to acknowledge receipt of the box of shells adding to our series of New Zealand species. We are flattered again by the comment ..." The work you have put into the different families have been a great help in arranging the groups in our collections here in N.Z. and sorting out etc. "

.. Incidentally members interested in exchanging for fine material should certainly write Mrs. Worthy. Your editor has hundreds of beautiful sets under her collecting label.

E.S. Richardson, 25 A Carlson Gone Rd., Auckland C3, New Zealand. " The members of the Auckland Museum Conchology Club desire to become corresponding members with your club, and as such have asked me as secretary for this year to write offering our club notes in exchange for your own. " "... We send greetings to the conchologists and paleontologists of your club."

A rough estimate is that we are mailing about 25 or more copies of our minutes to various correspondents in New Zealand and are in return receiving their excellent mineographed proceedings.

Mr . F.E. Shafer, R.R. 1, Trenton, Ohio. Many of us have beautiful material from Mr. Shafer while he was living in Cebu, Philippines. "... Although I have written many letters to P.I. friends, I have had very few replies. One of the officers of the corporation that employed me before the war is now back in Manila whwre he is liquidating such corporation assets as may have survived the Japs. He is an able business man- an executive who really knows his Philippines. I have written to him by air mail and may have a reply soon. If I hear from him I will be in a position to make more or less definite plans re my return to the P.I. I will be here for a long time yet so please mail me anything re shells that you can spare me. Me. Pedro de Mesa is well known to me. He is my friend and we have each visited the home of the other. I visitited him while he lived in Manila- a few months before the war. Mr. De Mes a returned to his former home at Lubang, Mindoro where I understand he owns his own property. I wrote hime there less than a monthago. Mr. De Mesa is honest and dependable which is more than I can say of several well known P.I. dealers and collectors. Before the war de Mesa and I were planning to work together and we corresponded regularly. I sincerely hope that Pedro has come through in good shape and that we will soon hear from him. Your Manila letter is not apt to reach him so I have given you above his last address as known to me. Just before the war Mr. de Mesas son (now mature) was working with his father at shell collecting and I hope to hear from him if his father does not write. I have forgotten the son's first name. Once I received pamphlets from Dr. Bartsch on land mollusks of the P.I. Please let me know his initials and address as I want to write to him. * (Dr. Paul Bartsch, U.S. National Museum., Washington 25, D.C.)* There was also a man living at Lantana, Florida, who sent me a book he had written on shells which was of help to me. If you know him please furnish me his address. * Dr. Maxwell Smith, Box 65, Winter Park, Florida.* I would like to get Dr. Bartsch's book before I get Mr. Webb's book or books. Perhaps you have seen that Jap book with colored plates. That book helped a lot as many of the species pictured therein were also P.I. species. Is there any magazine that would help ? If so please advice as to where same can be obtained. I surely need a review after three years in that Jap hold old city of Cebu. Before the war and old and dear friend of mine lived in Los Angeles. His wife had an interior decorating business. I have lost his address. His name is J.W? Schilling. If he is listed in your directory would you mind sending me his address. ... Dr. Asela Franco of Cebu City both collects and sells shells. She also has a considerable stock of Japanese postage stamps as used in the Philippines during the Jap invasion. Mrs. Helen Schlinger of Davao City, Davao, P.I. was a bigger dealer by fat than Dr . Franco . Dr. Franco survived the war. I do not know whether Mrs . Schlinger survived. ...."

We have just mailed Mr. Shafer a complete file of all available papwrs of our proceedings. Other members having duplicate books are invited to write him.

Mr. E.J. Post, 609 W. Emma St., Tampa 3, Florida. Mr. Post is one of our own most active of active members and the fact that he is now living in Tampa will never remove his name from our list of active members. We are indeed sorry to hear that he has not been in gold health. " I have not been over to the club at St. Pet. since I have been here. I have seen Mr. Emery once or twice. He is not very strong either."

Mr. C.L. Blakeslee, Mendon Center Road, Pittsford, N.Y. " I took out the Brachiopoda the other evening, that you once sent me with your usual kindness and it then occured to me that you might like some Cepaea or Helix nemoralis that I collected from a colony that I discovered here last summer (You may have noticed an account of it in the latest issue of the Nautilus). So tonight I got busy and selected a hundred from the quantity that I have and they are now in a strong- i hope- box and will go forward tomorrow. I made it a hundred as there may be some of your club members who would like a set for their collecyions. And, by the way, Dr. Pilsbry gives them the name of Cepaea. I had quite a little correspondence with him about it and it ended with his statement " Helix or Cepaea , it is a matter of majority of opinion, since neither can be said to be definitely the only right one or clearly wrong. In the present case , either Helix or Cepaea is " right" according to excellent authorities. " I had no intention of asking for anything in return when I began this letter but it just came to me that if someone would like to send me half a dozen Helix pisana I coulf use them. I have none."

The shells have arrivedd in perfect condition and will be available to the members when the editot can again be present with the shells. Any member having duplicated of Helix Pisand will be thanked for sending a set to Mr. Blakeslee and needless to say get his pick of a fine set of Mr. Blakeslees shells.

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New Publications

Proceedings of the Malacological Society of London, Vol. 26, part 6m, 31 January, 1946. A review of the many excellent papers in tnis issue should cover several pages. Therefore, we will simply mention the paper of importance to our own West Coast fauna.

Dr. S.S. Berry , pp 161-166, with two pages of plates and six text figures has given us a paper on Ischnochitonidae . It is a description of Stenoplax (Stenoradsia) heathiana n. sp. This is the species most of us have in our collections labelled Ischnochiton magdalensis Hinds. Dr. Berry states that Hind's species is in reality the species we know as acrior Carp. which left our common species without a name.

The Nautilus, vol. 59, no.3, January, 1946. This issue contains a number of fine papers but none of them dealing with West Coast species. There is a good photograph and a nice article on the life of George Willett.

Genera and Subgenera of the Pelecypod Family Glycymeridae by David Nicol of Stanford University and another paper by the same author " Restudy of Some Miocene Species of Glycymeris from Central America and Colombia". Both papers are published in the Journal of Paleontology, vol. 19, no.6, Nov., 1945. The work is well done and well figured and should be in all libraries.

The American Malacological Union, News Bulletin and Annual Report, 1944-1945. The membership list to date along with the many news items about members together with a number of well written papers makes this about the best of the annual reports. Mrs. Robertson should be congratulated. Incidentally all persons interested in shells should be members of the American Malacological Union. The dues are but $1.00 per year and should be mailed to Mrs. Harold R. Robertson, 136 Buffum St., Buffalo, N.Y.

The Value of Mussel Distribution in Tracing Stream Confluence by Dr. Henry Van Der Schalie- 19 pages and a number of plates. Published in Papers of the Michigan Academy of Science and Arts and Letters, vol. XXX, 1944.

Joseph Pitty Couthouy- A Bibliography and Catalogue of His Species by Richard I. Johnson. Occasional Papers on Mollusks, Dept. of Mollusks, Mus. of Comparative Zoology, Harvard College. vol. 1, no.5, Feb. 14,1946. Another paper in this series vol.1, no.6 is:
The Egg and Breeding Habits of Oncomelania quadrasi Mlldf., the Schistomiasis Snail of the Philippines by Lieutenant Tucker Abbott.

Vitrinellidae and Similar Gastropods of the Panamic Province, Part I by Henry A. Pilsbry and Axel A. Olsson, Proceedings of the Academy of Natural Sciences of Philadelphia, vol. XCVII,1945, pp. 249-278.

This carefully prepared work dealing with West Coast species should be in all libraries on this coast.

A Bibliography and Short Biographical Sketch of William Healey Dall by Paul Bartsch, Harald Alfred Rehder and Beulah Shields, Smithsonian Miscellaneous Collections, vol. 104, no. 15, Jan. 30,1946. This list of Dr. Dall's works will be of particular value especially to those of us who wish if possible to add all of Dr. Dall's work on West Coast species to their libraries. Perhaps some of them are still available.

Revista De La Sociedad Malacologica " Carlos De La Torre", vol. 3, Dec. 1945, no.3. This excellent publication in Spanish should certainly be in every conchological library. The address is Apartado 2654, Habana,Cuba. $2.50 per year.

Mollusca, vol. 1, no.8, Feb.25,1946 published by Paul H. Reed, Box 267, Tavares, Florida. Price $2.50 per year. Mr. Reed is to be congratulated on the continued excellence of his periodical. It has become a necessary part of every conchological library. A number of new species have been described and beautifully figured in Mollusca as well as many other fine papers by conchologists of international repuration. If you are not now a subscriber to Mollusca you are missing something.

The Natural History Museum Bulletin of the Natural History Museum, Balboa Park, San Diego is on my desk for February and March. All residents of this coast are very proud of the activities of this great institution. However, we will here simply report on the conchological work. " Accessions received by the Conchological Department numbered over 900, of which 330 were new to the collection. The catalogueing of shells was continued. To date 189,664 specimens have been numbered and labelled. The collection has been made available for reference to many people, including servicemen and others seeking identifications etc. " The March issue tells of the many members and friends in the service sending boxes of specimens. All this is added to the several of the finest collections of shells ever accumulated on this coast.

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Ramon Masini, No. 2954, Montevideo, Uruguay. I have on my desk a letter from this gentleman in Spanish in which he advises that he has a very large stock of mollusks from his country, marine from the Atlantic, fresh water from the Rio de la Plata, many land shells and also fossil species. These he is desirous of exchanging for specimens from elsewhere.

Your editor regrets that he does not have the time to exchange with him. I trust that other members will enjoy this correspondent.

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Harold J. Jacobs, 538 N. Palos Verdes St., San Pedro, Calif. Mr. Jacobs is a deep sea diver and has been selling some exceedingly rare and fine shells. Those interested in really fine material should write him.

Dr. W.O. Gregg, 2200 S. Harvard Blvd., Los Angeles 7, Calif. " We had a very interesting meeting on Jan. 8. The meeting was devoted to the study of Acmaeas and differences of opinion were amicably discussed. Dr. Hill showed us a specimen of Carinaria which Mr. Bauman had picked up on the beach at Surf, the first I had ever seen.

I will list some of the pertinent matters on the Acmaeas: It is my opinion that the name Acmaea tessulata patina Esch. should be used instead of A. t. scutum Esch. for our common west coast form; reasons given by Dr. Pilsbry, Nautilus 36:71. This would not hold true if there were an earlier reviser than Carpenter who used the name A. scutum for the species. I note that under A. tessulata you list A. emydiaa as a synonym. I am unfamiliar with A. emydia and have never read its description but the thing from Drier Bay, Alaska, which Dr. Dall identified for me as A. emydia is nothing but a color form of A. persona. It is an elevated shell and has the typical sculpture of persona. Doubtless other records are based on such misidentifications. How far south does true A. patina (or scutum if such you wish to call it) extend ? Neither Mr. Chace nor I have ever seen specimens from south of Cayucos and I am definitely of the opinion that southern records are based on misidentifications.

I consider A. nacelloides, A. monticola, A. olympica and A. hybrida but situs forms of A. pelta Esch.

Specimens identified by Dall Dall as Acmaea atráta Carp. (mentioned in Minutes 57:15) are obviously unusually elevated forms of A. conus Test. They are very different from specimens of Acmaea atrata from Magdalena Bay. Lower California. I am of the opinion that other reports of A. atrata from the coast of California represent similar misidentifications.

Phasianella lurida Dall: I have specimens of this from Pt. Reyes, Calif. Specimens in my collection labelled P.lurida from Piedras Blancas are P. pulloides.

In Strong's key to the Turbinidae on pages 20 and 21 it would appear that Homolapoma carpenteri and H. luridum are reversed.

I have a specimen of Tegula from Pt. Vicente which Dr. Dall identified as young Tegula impressa (Jonas), with the note " Most northern locality yet noted". I had previously considered it to be a young and unusually colored specimen of T. ligulata but a careful study of its nivroscopic sculpture and the shape of the umbilicus and comparison with young of T. ligulata reveals it to be a distinctly different thing."

" Have gone over the notes in Minutes #58 (March). When you are at home and have time I would like to go over my Margarites material with you. Did I ever give you specimens from the Pt. Reyes lot which Mr. Willett called M. lirulatus obsoletus (Carp). If the identification is correct that is an extension of range."

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C. Ray Fowler, 3615 E. 5th St., Long Beach 4, Calif.
Mrs. O.C. Evers, 412 N. Lake St., Los Angeles 26

The two names above are new members of the Long Beach Shell Club. However, I believe Mrs. Evers will return to Florida in May.

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Mr. E.P. Chace, 24205 Eshelman Ave., Lomita, Calif. I am glad to have the following comments from the club members on some of our recent reports.

Cucxulinidae- No comments

Phasianellidae-- T. compta- Some of the club questioned the extreme ranges. Say large T. pulloides could be confused with T. compta.

T. pulloides- May go down the Lower Calif. coast but not into the gulf. A.M.S.

(con.)

Astraea undosa- 2 more loc records if you want to use them. Santa Barbara- Albert Bauman, Carpenteria- Gillis. Southern range " almost to Scammon's Lagoon" A.M.S.

Astraea gibberosa Dall. O.K. by the club. My own comment is that Dall's ~~pac~~ pacifica is a ½ grown shell and montereyensis Oldroyd the mature form, and that the artist who made the figures for Martyn rather exagerated the bumps on the periphery of the whorl and did a bum job generally.

Homolapoma baculum. Point Arguillo (Albert Bauman). Northern records in question- the Puget Sound records are almost certainly based on the shells that were later described as H. engbergi.

Liotia- Arene a. bristolae. Range in list, page 25 gives San Pedro- on the next page gives San Diego.

Page 30 in the Key. gemmulatum is given as San Pedro to the Gulf. I have specimens from Cayucos. E.P.C.

Norrisia norrisii. Monterey record heeds chacking. No member has it from that far horth.

Tegula gallina- " Not in the Gulf" A.M.S. No criticism of your statements about the varieties.

Tegula brunneum- Crescent City, Calif. Chace.

Tegula b. fluctuosa - Those who said anything on this felt as you do. Var. of little value.

Tegula montereyi- add if you wish, Morro - in the bay (M. Caruthers).

Tegula regina- H. Jacobs has brought up two. Expects to go back and get more. Add Santa Barbara Island to the range.

On Margarites- A.M. Strong's comments- Carpenter's species are practically nude names. Some of the species were in the Cooper collection and the mice got into it and destroyed most of the labels. It is at U.C. Dall figures a lot of Margarites in Bull. 112 but the figures do not fit the Carpenter descriptions. Some species may be in the Carpenter collection at McGill Univ., Montreal (See Art. in recent Nautilus). The Cooper shells were described in an old Calif. Acad. paper and the Calif. Acad. has a copy of it (Most copies were destroyed in the big quake and fire). Cooper's shells were dredged off Catalina Island but the locality given for them is as you gave it- San Diego-San Pedro area.

Margarites optabilis- Has been taken at San Luis Obispo by M. Caruthers. Comment that it is quite variable.

Turcica caffea Gabb- Has been taken at San Onofre (dead or crab specimens)

Calliostoma gloriosum- Has been taken in Morro Bay by M. Caruthers (June)

Calliostoma eximium- Strong says " some Central American point but not in the Gulf fauna, or north of there."

Calliotoma tricolor- I have specimens from the San Pedro breakwater years ago.

C. ligatus (Gould) (C. costatum) - San Diego record probably an error

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Dr. A. Myra Keen, Box 1563, Stanford University,Calif. Looking over the February Minutes (No. 57), I am puzzled by your reference on p. 11 to Acmaea hybrida Shepard. Although there is a mention in our copy of Nautilus vol.9, p.72, of the variety in question, it is a nomen nudum, there being no word of description. A half hour's search of the literature fails to bring to light the paragraph you quote. " * Note* That reference was copied from some data from Mrs. Test. Perhaps the editor overlooked something *

" Recently Stanford University received a donation from Mrs. Charles L. Simons consisting of over 400 species of microscopic shells, mostly West Coast gastropods."

New Publications

Dodge, Henry, " Notes on *Strombus dentatus* Linne and the *Strombus urceus* Complex", American Museum Novitates, No. 1314, March 14,1946.

This is a very interesting paper of 8 pages and 0 8 figures.

Clench, William J., " The Poison Cone Shell", Occasional Papers on Mollusks, vol. 1, no. 7, March 15,1946.

This is a republication of Dr. Clench's paper published some time ago in the Amer. Jour. of Tropical Medicine, with some additional data and figures.

Report of the U.S. National Museum for 1944. 100 pages.

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All students of natural history will mourn the passing of Dr. Clinton G. Abbott, Director of the San Diego Museum of Natural History. While it is true that Dr. Abbott's specialty was ornithology, he was always interested and glad to give every possible assistance to students in all groups of natural history study.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA- April,1946.

The Conchological Club of Southern California met at the usual time and place tuesday, April 2,1946. The meeting was called to order by Dr. Gregg. There were eleven members present and one visitor, Arthur C. Bird, who expressed a desire to join the club. There were no reports from the standing committees.

A program of papers to be given in connection with our regular study schedule was arranged for the next three meetings as follows:

May- Mrs. Mary Turver, " Collecting in Mexico".
June- E.P. Chace, " Chitons of Australia".
July- A.M. Strong, " Cones of the West Coast".

The scheduled study used up the rest of the time. It concerned Vitrinellidae, such tiny shells that most of us know very little about them, but which are very beautiful and interesting. The meeting was then duly adjourned. Effie M. Clark, Secretary.

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E.V. Edmonds, Amherst Hotel, 2231 Shattuck Ave., Berkeley, Calif.

The above is " Eve's" new address. Mrs. Edmonds and Bob are joining him there.

Donald Cordry, Fray Angelico #30, Mixcoac, D.F., Mexico. " I am a collector of marine shells and would be most grateful for your list of specimens. Am going on a collecting trip in the near future (Acapulco) and will be glad to look for things that you are particularly interested in, if you tell me what you want. I have several fine *Spondylus limbatus*, 5 and 6 inch examples that I would like to exchange for *Spondylus pictorum*. I am interested in Conus and expect to get good examples of the following on my trip: Conus *princeps*, *purpurascens*, *brunneus*, *pyriformis*; *Thais triserialis biserialis*, *kiosquiformis*; *Vasum caestus*; *Phyllonotus princeps*, *oxycantha*. If there is anything special that you want let me know."

Captain Carl Mathews Dumbauld, 59204, U.S. Naval Hospital, Portsmouth, Va. Captain Dumbauld has been serving in Panama. The above is his new address.

Garrett, Wendell, 4456 Verdemour Ave., Los Angeles 32, Calif. asks about buying shells.

Mr. Wm. G. Fargo, is now back in his Michigan home, 506 Union St., Jackson, Michigan.

Friends of Colonel H.G. Schenck of Stanford University will find the following of particular interest.
Nippon Times, Wed., Feb. 20,1946. And also the following account in Stars and Stripes, Feb.20,1946. " American Officer 2nd U.S. Soldier to Meet Emperor- Tokyo (INS).- Col. H.G. Schenck, of Palo Alto, Calif., became the second American officer to talk to Emperor Hirohito since the war when he met the Japanese ruler in the biological laboratory within the palace grounds.

Gen. Douglas MacArthur was the first officer to meet Hirohito.

Schenck, who heads MacArthur's natural resources section, was inspecting the collection of shellfish in the laboratory when Hirohito walked in. The emperor, himself a biologist, had a long discussion with the American officer, and asked him about Dr. Henry Pilsbry of Philadelphia, who has done extensive work in this field."

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Wray Harris, Honolulu, T. Hawaii. " Captain S.M. Kimball passed through Honolulu last week on his way home from duty at Okinawa. He brought with him the first Ryu Kya collection of shells I have seen, and I think the largest from that region. Is on his way to Weaverville, Calif. where he will work up his Pacific Area material."
Charles D. Nelson, R #5, Lake Michigan Dr., Grand Rapids, Mich. We wish to thank our friend Nelson for the fine box of fresh water shells recently received, but are concerned over his report that he has been having trouble with his eyes and expects to have one eye operated on soon.
He asked for the Turbers address- Mr. and Mrs. H.R. Turver, 8640 Evergreen Ave., South Gate, Calif.
H.S. Mort, 13 Milner St., Mossman, N.S.W., Australia. " In one of your recent Minutes (October I think), the American Janthinas were discussed. Many years ago I think about 1928, our beaches were covered with a species we used to call exigua, but is now classified by Iredale as I. capreolata Montrowzier. This is very similar to your bifida, but judging by specimens of bifida which Mr. Caruthers sent me from California, our shell is larger and the sculpture more pronounced. I am getting Mrs. Woolacott to send you a small parcel of those from my duplicates and should be glad to have an opinion of them from Dr. Myra Keen or some other authority as to whether she considers them to be distinct from bifida or not. I shall be glad if you will distribute any surplus shells among your members. They were collected at Sarrabeen Beach, about 7 miles north of Port Jackson, and at the time all beaches within 30 miles of Sydney were thick with them; I made a check of one section and found between 200 and 300 shells per yard of beach, and as there are over twenty miles of similar beach near Sydney it would make well over 10 million shells near Sydney alone. This species is normally less common than the fragilis type , but appears to have about a 4 year cycle when it is more plentiful. I. globosa is a much rarer shell and I have never seen it in large quantities on the beaches. By the way I have had shells labelled globosa from Florida which are much paler than ours and correspond exactly with the figure of I hervieri in Tryon. The largest specimens of the fragilis type I have seen were from Norfolk Island, although I have very large ones from Cape Byron (most easterly point of Australia.)

With regard to the spelling of Ianthina, mentioned in your February Minutes the majority of English words beginning with J came through the French and the J has been adopted from that language, but Ianthina comes directly from the Greek (which had no J), and for that reason I certainly prefer to spell it with an I. I fancy that taxonomically Ianthina is older

(con.)

as all the older books seem to use it. I hope it will not be troubling you too much to get an American opinionon my specimens, although Iredale is seldom wrong in his identification of local species, it is always well to get another opinion, especially in the case of a pelagic genus like Ianthina.

Wishing Tom and yourself, also the Conchological Club the best of hunting in 1946. I always look forward to the arrival of the " Minutes".

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This is a very fitting place to announce the arrival on March 12 of Ruth Janthina Burch, daughter of Thomas A. and Beatrice Burch. No- your editor does not feel any older, having already become accustomed to being called " Gramps".

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A. Sorensen, 247 Granite, Pacific Grove, Calif. The editor and Mrs. Burch had the pleasure of being " Andy's" house guest for a night a week or two ago. We all enjoyed a lecture by Dr. Bolin of the Hopkins Marine Sta. on " Deep Sea Fish". Andy had just returned from Guaymas with a large lot of beautiful and some very rare material. However, he is even now off on another jaunt to Punta Penasco, Mexico after more.

Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif. We were also the house guest of our member and enthusiastic collector in San Luis Co. Mr. Wilcox devotes his time to shell collecting and his art. His paintings are remarkably fine.

George Pattison, 68 Partridge St., Glenelg, South Australia. I have just received the January " Minutes of the C.C. of S.C." Your Minutes are appreciated and found valuable for reference. So my wife binds them together in book form for that purpose. I am interested in: Marine Life in General- World Wide Sea Shells- Land and Fresh Water Shells- Buy Books on Shells Illustrated and Described.

I have spent most of my life seafaring in wind jammers of every rig, and lighthouse keeping until I retired 14 years ago. For 40 years I have been a keen conchologist. So a big fraternal Cheerio of good wishes to you and members of your club."

Dr. W.O. Gregg, 2200 S. Harvard Blvd., Los Angeles 7, Calif. " This rain should be good for land snails (March 30,1946). Last Sunday I went up into Kern County and found live Helminthoglypta berryi. Some of these days I will write a paragraph or two on its ecology and also soon I will write up my five day trip into San Diego and Riverside counties. On the San Diego trip one of the snails we found appears to be one of the lost species. More about it in my story. "

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Many of us have received fine specimens from Mr. Ramon Fontecha formerly of Davao City, Philippines. Mr. A. Sorensen had sent him a letter by air mail immediately after the end of the war. We were shocked to see the terse comment on the envelope returned to Mr. Sorensen " Mr. Fontecha was killed by the Japs."

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Mr. Pedro De Mesa, Lubang, Mindanao, Philippines. " Your letter of Sept. 2 received. Thanks that a friend in Manila P.O. found it. The house I rented in Manila (in Zaragoza St.) got burned and the shells I collected from Mindanao,Samar,Cebu,Iloilo and Leyte that I left there when we evacuated got all burned. My big collection not only of P.I. shells but also shells from N.and S. America and foreign countries acquired for 30 years until 1941- got burned in Lubang. The Japs burned half of this town when they retreated to the mountains and our three houses were included. My collection of old books, stamps, coins, medals, old china dishes

(con.)

and antique furniture turned into ashes. When we evacuated the town we were ableto take along with us two sets of clothing and dresses for every member of the family so that after six months all became worn out so we remain barefooted and almost naked when Lubang was liberated (April 1, 1945). Lubang Id. being isolated and small, never been reached by relief of any kind from the Govt., Red Cross or the Army. The black market is terrible so you can immagine how hard it is to one who will have to start buying everything of needed materials in life at least one piece of every kind for every member of the family. I have appealed to various collectors on the Atlantic coast , like Dr. Clench of Harvard to help a fellow human being in distress. I am at a loss now. Do not know where to begin and how to start. If you are acquainted with the Red Cross chapter in your city please help us to secure some things of any kind- at least those needed for the four baby girls- ages- 3-2½-1 yrs. old- and one 3 months old. Two of these are crippled as a result of living in jungles to be far away from Jap barbarisms and atrocities. Second hand and worn out baby dresses will help lots- we can repair them. Thanks for the thought please. Once we get a little bit settled I shall resume collecting shells again. I am now more interested in the snails that are intermediary to human diseases as blood flukes, liver flukes and the like. Best wishes and kindest regards to you and yours with prayers.

P.S.- Till now, there are 50 Japs alive with arms on the mountains of Lubang. We have no army here except two policemen.

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Mr. De Mesa also sent a 3 page legal size document, certified and sworn to giving a detailed account of his heroic assistance to our armed forces throughout the war.

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A further note on the above may be that we have just mailed Mr. De Mesa the fourth box of baby clothes and trust that other members will also do what they can.

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Mr. Otello Ciarla, Rua Augusta na 91, Rio de Janeiro, Brazil. Mr. Ciarla is a member of the " American Malacological Union" and interested in West Coast shells.

Glenn Webb, Ohio, Illinois is now at the University of Illinois and we hear quite happy about it.

Harold Harry, Rt. 2, Box 222, Shreveport, La. We are happy to learn that our friend and fellow member expects to enter Stanford and later study at the Hopkins Marine Station so we will again have him with us on this coast. Also the editor wishes to thank him for the fine box of duplicate shells.

Mr . Arthur White, 11 Porter St., Everett 49, Mass. Mr. White is interested in purchasing shells. Is particularly interested at this time in Scaphopoda.

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More New Publications Received

Dr. S. Stillman Berry, " Two New Chitons from the Gulf of California", The American Midland Naturalist, vol. 34, no. 2, pp 491-495,

This paper is prepared with the usual thoroughness of Dr. Berry and should certainly be in the library of all interested in this group.

SHELL NOTES, by Frank Lyman, Lantana, Florida. Numbers 15 and 16 arrived together. Frank is now republishing with all plates the rare book "Shells Which Have a Fascinating Story" by Howard Gilmore. His paper seems to improve with every issue. If not on his list you should be.

Auckland Museum, Conchology Club have sent out their interesting Feb. bulletin with many items on the fauna of New Zealand.

Minutes of the Long Beach Shell Club

Feb. 10,1946. The Long Beach Shell Club has decided to continue its wartime schedule so meets in the Childrens room of the public library the afternoon of the second Sunday in the month at 2:30 P.M. This day there were 13 members and 7 visitors. Mrs. Turver was in Mexico collecting shells. Mrs. Evers of Florida was to return to Florida the next day. Patricia Rolo attended for the first time. This year we are to have printed programs for the year and they will be ready soon. The club approved the Agassiz Club resolution favoring a move to obtain a museum for Long Beach with aquarium attached. The speaker was Mr. E.P. Chace who took Acmaeas, " the most diversified group of shells" . Using the new Conchological Ckeck List of the Southern California Club, he explained puzzling items and described habits and habitats of the individuals illustrating with specimens from his own and Mr. Baker's collection. Members felt it one of the most interesting meetings.

March 10,1946- Mrs. Chace served as secretary at this meeting, Mrs. Libby , vice-president had the programsready, but upon suggestion of club members it was decided to back the program with a list of names and addresses of members. Attention was called to an article in current Nautilus of a biography of Mr. George Willett. Laura May Totten was welcomed as a new member. Thanks of the club was extended to Mr. Howard Hill of the L.A. Museum for keeping a changing shell collection in the Long Beach Service Club. The day's program directed by Mr. Chace was a symposium on the lives and works of older conchologists.

April 4,1946- At the April meeting both the president and vice-president were unavoidable absent so the secretary took charge of the business part and Miss Rogers kindly introduced the program and speakers. Mrs. Chace again supplied as secretary. Reference was made to the report that giant snails had been introduced into the Philippines as food for the Japanese and have now become a menace to agriculture. Mr. Ulrich reported a successful collecting trip to Portuguese Bend. Raymond Fowler, a new club member was then presented by Miss Rogers and sketched for the club his introduction to shell collecting when in the third grade, and illustrated the spread of his interest by showing many very beautiful and attractive collections. His deep interest and ease of delivery and laughable personal stories made an enjoyable item on the program. This talk was followdd by showing of his own collection by James Gorman, our youngest member. Specimens of live shells collected in Guaymas, Mexico were offered to members by Mrs. Turver. The meeting was then adjourned to view Mr. Ulrich's beautiful collection of shells on display in the library.

Ruth E. Eaton, Secretary.

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W.E. Griffith, 24(Aster) Melita St., Sliema, Malta. We were pleased to have a long letter from our old correspondent in Malta. Many of us have large sets of fine shells from his collecting. However, at this time he seems to have deserted us to some extent and has gone into the postage stamp business. He writes" And would be very pleased if you would put me in touch with anyone either a dealer or collector who would like to do business with me either for cash or exchange, but I am afraid at the moment it must be by exchange. As mails take so long to arrive, you might pass the word that whoever you recommend me to can start by sending me a few say six of each of U.S.A. Commemoratives he may have and let me know what he requires. I can supply British Colonials and of course Malta stamps. "

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COLLECTING IN SEAWEED HOLDFASTS

by Allyn G. Smith

Seaweed holdfasts are a good collecting ground for marine shells, which nestle or hide in the twisted mazes of the kelp roots. Those that are torn loose from their rocky moorings and washed ashore after heavy storms often contain species that are rarely found, even by dredging.

On a number of different occasions, when searching the off-shore beds of the giant kelp (Macrocystis) in Monterey and Carmel Bays of California with a row boat, the attempt has been made to pull up the kelp by the roots. This is often impossible if the roots are well anchored as the stems usually break first. Sometimes, however, the attempt has been successful and the holdfast brought to the surface, often with a heavy boulder or slab of rock on which the kelp roots grew. In such instances the reward in shells collected from the roots and their attachment is usually worth much unsuccessful effort.

In Monterey Bay, about a quarter of a mile off shore, extending for a stretch of two or three miles from Del Monte toward Moss Landing, there used to be a fine bed of kelp. Unfortunately, it has been gone for many years, having been torn out completely during an unusually severe winter storm in the late 1920s. Dr. Harold Heath of Pacific Grove, once said that after this storm the kelp was piled six and eight feet deep on the Del Monte Beach. What a marvelous opportunity for any shell collector who may have been there at the time. The destruction of this bed was a real loss from the collectors standpoint as it was the habitat of the finest specimens of Calliostoma and Tegula that have been taken from the Bay. In addition, it was a prolific area for shallow dredging, which always produced good results.

In June,1922, while hopefully hauling on kelp stems to break one of the roots from its fastenings, one finally gave way and was brought to the surface from a depth of about ten fathoms. It proved to be an unusually large and complete one, with a widespread tangle of roots nearly four feet in diameter and two or three feet thick. Along with the roots came several slabs and many shattered fragments of shale. When cut from the stems this holdfast almost completely filled the small row-boat, so it was taken ashore and thoroughly searched for shells. The haul proved to be so rich that a record was kept, which came to a total of 53 species and about 440 specimens. The list follows:

Pelecypods- Lima dehiscens Conrad- 1 juv.; Lithophaga plumula (Hanley) - 1 valve; Lucina annulata Reeve- 1 juv.;Nuculana penderi (Dall)- 1 valve and 2 juv.; Nuculana taphria (Dall)- 1 juv.; Pecten hastatus Sowerby-1 juv.; Petricola carditoides (Conrad)- 1 juv.; Philobrya setosa (Carpenter)-1; Psephidia salmonea (Carpenter)-1; Rochefortia aleutica (Dall)-2; Saxicava arctica Linnaeus- 1 juv.; Volsella fornicata (Carpenter)- 1 juv;

Gastropods- Alvania acutilirata (Carpenter)-3; A. purpurea Dall-4; Amphissa reticulata Dall-22; Balcis thersites (Carpenter)-65; Balcis n. sp. -2; Bittium attenuatum Carpenter-56; B. quadrifilatum Carpenter-122; Calliostoma costatum (Martyn)-25; C. splendens Carpenter-2 (1 juv.); Crepidula adunca Sowerby- 10 juv.;C. lingulata Gould-1; C. sp. indet.-1 nuclear stage, possibly C. perforans Valenciennes; Daphnella fuscoligata Dall-2; Diaphana californica Dall-2, a new northern record; Diadora aspera (Eschscholtz) - 14 juv.; Epitonium tinctum (Carpenter)-1; Homalopoma carpenteri (Pilsbry)-112; H. paucicostatum (Dall)-25; Lacuna solidula Loven- 1; Margarites salmoneus (Carpenter)-14; Mitrella gausapata (Gould)-

(con.)

M. tuberosa (Carpenter)-4; Mitromorpha aspera (Carpenter)-4; Nassarius mendicus (Gould)-2 juv.; N. perpinguis (Hinds)-1; Ocenebra fusconotata (Dall)-4; O. interfossa Carpenter- 1 adult, 2 juv.; O. n. sp.-2; O. sp. ? - 7. Similar to O. lurida munda (Carpenter) but not this subspecies and may be new; Odostomia oldroydi Dall and Bartsch-5; O. (Evalea) sp. indet. - 1; Phasianella pulloides Carpenter- 2; Pseudomelatoma torosa (Carpenter); Puncturella cucullata (Gould0- 1; Seila montereyensis Bartsch- a fragment; Tegula pulligo (Martyn)- 1 juv.; Turbonilla serrae Dall and Bartsch-1; Turcica caffea Gabb-1.

Chitons- Lepidochitona species ? - 1; Ischnochiton mertensii (Midd.) 1 intermediate valve; I. species ? - 1 too young to determine.

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Additions and Corrections

The following data was submitted by Mr. E.P. Chace following the club discussion at the April meeting.

" Margarites optabilis- range Monterey to San Diego
Megathura crenulata- add Santa Cruz, Calif. (Turver)
Fissurella virescens- Tremper had one specimen taken at San Pedro(Strong)
Diadora aspera and D. densiclathrata are distinctly different based on anatomical work (Strong);
Fissurella volcano- Crescent City record needs confirming.

The following data has been submitted by Mr. Morris Caruthers:

Calliostoma supragranosum- Laguna Beach (plentiful);San Pedro breakwater; White's Point, San Pedro.
Calliostoma costatum- Cayucos; Piedras Blancas.
Calliostoma annulatum- Puget Sound; Morro Bay (one living specimen); Monterey.
Calliostoma canaliculatum- Laguna Beach (not rare); Morro Bay (inside); Monterey.
Calliostoma gemmulatum- Morro Bay (inside); Cayucos; Laguna Beach (not rare).
Calliostoma tricolor- Laguna Beach (small specimens); Morro Bay(inside).
Calliostoma gloriosum- Morro Bay (two large specimens); Corona del Mar.

The following data has been submitted by W.J. Eyerdam:

Haliotis kamtschatkana Jonas,1845- Type locality: Unalaska, Kamchatka Sea (I presume that was the old Russian name for Bering Sea.). " I am rather skeptical about the Unalaska record as type locality, but it may be correct. Ask Bartsch whether there are any specimens in the National Museum from the Gulf of Alaska or the Aleutian Islands. I know that they are quite common on the outer coasts of some of the S.E. Alaska islands and W. Washington Island. The following were collected by Eyerdam and are all quite similar: Craig, Prince of Wales Island, and Baranof Island, S.E. Alaska and Hakodate, Japan.

Fissurella virescens Sowerby,1835- Mazatlan, Mexico and Corinto,Nicaragua Collected by Eyerdam, 1938 and 1939.

Diadora inaequalis Sowerby,1835- Mazatlan,Mexico; Corinto, Nicaragua; Gulf of Fonseca, Honduras, and Talara,Peru- Eyerdam,1938 and 1939. Extended range southward from Ecuador.

Diadora aspera Eschscholtz,1833- Rosario Beach, Skagit Co.,; San Juan Islands; Port Orchard, Kitsap Co.; Clallam Bay, Clallam Co., Wash. " The specimens collected at Rosario Beach were taken from rocks at night time. About two dozen of them supported a commensal wormHalosydna lordi Baird about 2 inches long under the mantle of the shell. These worms belong to the family Polynoideae and are also sometimes to be found in the gill groove

(con.)

of the giant Chiton Cryptochiton stelleri.

Puncturella major Dall,1891- Strait of Fuca (Eyerdam).

Puncturella galeata Gould,1846- Izhut Bay, Afognak Island; Drier Bay, Knight Island, Alaska; and Strait of Fuca (Eyerdam); also Hinchinbrook Island, Alaska (Norberg).

Puncturella eyerdami Dall,1924- Only known from the two type specimens at the National Museum- collected by Eyerdam in 1923 in 15 fms. shell and mud at Drier Bay, Knight Island, Alaska. A distinct species which should be figured.

Puncturella cucullata Gould,1846- Sitkalidak Island, Izhut Bay, Afognak Island; Drier Bay, Knight Island; and Strait of Fuca (Eyerdam); and Hinch--inbrook Island, Alaska (Norberg).

Puncturella multistriata Dall- Seymour Narrows, B.C.; San Juan Island;l and Strait of Fuca, Wash. (Eyerdam).

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W.J. Eyerdam* " A fellow that worked with me last summer did quite a lot of diving for abalones in Half Moon Bay. He claimed to have taken Haliotis rufescens with the animal 18 inches across. Do they really get that big or did he get his figures mixed up ?"

* Editorial note*- Your editor sampled the stuff in that Half Moon Bay tavern one time and it didnt seem to effect him that way. But just the same it will be appreciated if someone will advise us if they know about the dimentions of the largest specimen of rufescens on record. But an 18 inch one would be a shell collection in itself.

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H. Groendyle, Bi Idtschestraat 15, Leeuwarden, Holland. " I should very much appreciate it if you would like to exchange your duplicate shells with me. We have here in Leeuwarden (Frierland- Holland) a museum for natural history, for which institution I am collecting shells. At present I have the following list of duplicates for exchange. I hope I'll soon be able to give a more detailed list. If you should happen to have more specified wishes please write."

Max G. Hammerschlag, 325 Grove Road, South Orange, New Jersey. wishes to purchase specimens of Trophon triangulatus and Murex scorpio. I have no doubt but that the shell he wishes is the species we now call Forreria catalinensis Oldroyd rather than the small species we now call Trophon triangulatus.

Mrs. Witherspoon, 462 Shady Ave., Sharon, Pa. is interested in purchasing shells.

Keith A. Yenne, 37 Prentiss St., Cambridge 40, Mass. asks to purchase a copy of our Illustrated Glossary.

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Ward's Natural Science Establishment Inc., P.O. Box 24, Rochester 9, N.Y. This firm wishes to purchase a number of the Ischnochiton conspicuous complete with the animal preserved in alcohol- a hundred or several hundred. They are also interested in a quantity of any species of Dentalium also preserved in alcohol with the animals complete.

Perhaps some of the members may be interested in collecting these for them.

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Minutes of the Conchological Club of Southern California- May,1946

The Conchological Club of Southern California met as usual, May 7, 1946. The meeting was called to order by the president. There were 20 members and three visitors present. The visitors were Mrs. Mary Wright, mother of Dr. Wright, Nettie B. Waut, 1119 Arapahoe, a guest of Mrs. Bagley, and C.O. Reis, 646 Juanita Ave., Los Angeles, who expressed a desire to become a member of the club. A long absent member, H. Carroll McGowan, now living at Santa Barbara and who was in the city on business, was present for the first time in several years. There were no reports of standing committees so the scheduled subject for the evening " Collecting Marine Shells at Guaymas, Mexico" was taken up first by Mr. Harry Turver who enumerated the things that should be provided for a trip of that time, how and where to get passports, the things that could be obtained there, health precautions, estimated expenses and weather and road hazzards. He described the nature and extent of collecting grounds there and on the way, and gave an interesting account of the people and their general welcoming of travellers as well as some of the things they rightfully resented at the hands of thoughtless strangers.

Mrs. Turver followed giving a very interesting account of a trip that she and two friends took to Guadalahara, the second city of Mexico. The distance was considerable, the accomodations far from adequate, and the delays tedious. On their arrival, in the midst of a fiesta, they found themselves very much jammed in the crowds attending a political gathering. They heard a speech by the governor which she declined to repeat to us, it being, of course, in Spanish. They witnessed a lengthy parade either drawn by all kinds of animals or bearing them on their backs. She brought many snapshots and a box of their most interesting ' finds' as well as a gift box of duplicates.

Their combined reports gave us a better understanding of what to do and what to expect in the way of enjoyment and of materials to be found.

An exhibit of the Lapidary Club was in the main building and on invitation, the club adjourned to attend it. We found it extensive and most beautiful. Effie M. Clark, Secretary.

Copy of Attendance Register- May 7,1946

Mr. and Mrs. Gillis, 1904 N. Madison Ave., Pasadena 6.
George P. Kanakoff, Los Angeles Museum, Exposition Park, Los Angeles
William Rudex
Albert D. Howard, 2307 W. 20th St., Los Angeles
Mr. and Mrs. E.P. Chace, Lomita, Calif.
Dr. Charles R. Wright, 601 O. St., Sanger, Calif. Ph. 348 W.
Mrs. Mary A. Wright, 410 N. El Molino, Pasadena.
Harry R. Turver and Mary E. Turver, 8640 Evergreen Ave., Southgate, Calif
Nettie B. Waut, 1119 Arapahoe St., Fi. 8051
Laura B. Bagley
H. Carroll McGowan, 4277 Hollister Ave., Santa Barbara, Calif. Ph. 24623
Morris E. Caruthers, 120 E. Chestnut St., Glendale, Calif.
A. Boughman
Dr. and Mrs. Howard R. Hill, Los Angeles Museum.
C.O. Reis 646 Juanita Ave., Los Angeles 4
Mr. and Mrs. E.P. Baker, Downey, Calif.
Arthur C. Price 2618 Wellington Rd.,
Effie M. Clark.

Pyramidellidae.

*** The editor wished to thank those who have been contributing to our fund. It seems logical to assume that those on our mailing list who have not done so are not interested and those names will be dropped after this issue. It has been just a year since we first asked for yearly contributions. Our publishing fund is again exhausted. The plans are for another large number covering the Turridae to be followed by another on the Chitons. We then expect to publish a complete index of everything covered in the Minutes to date. This is being prepared by Mrs. Thomas A. Burch and will be somewhat voluminous. ***

We have received a number of requests for our Illustrated Glossary from outsiders. It seems that we should receive at least one dollar to our fund for additional copies of this paper. We still have some stock of our bound report on the Pelecypoda for which we have been getting $5.00.

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7.30 P.M. at the Los Angeles Museum, Exposition park, Los Angeles, Calif.

Please mail all shell news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965.

The editor is again at home after an extensive business trip to San Francisco during which time these papers were badly neglected.

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Dr. A. Myra Keen, Box 1563, Stanford University, Calif.

" I have just noted an oversight on my part in connection with Margarites cinereus (Couthouy). Rehder has shown (Proc. Biol. Soc. Washington, vol. 50, pp. 115, 1937) that this is a homonym and that the first available name is Margarites costalis (Gould), 1841, ex Loven MS. The reference for this is Gould, " Invertebrata of Massachusetts", p. 252.

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The program committee of the Conchological Club of Southern California has announced the following special papers.

June- Chitons of Australia by E.P. Chace
July- Cones of the West Coast of America by A.M. Strong
August- Pectinidae by M. Caruthers
September- Land Snails of the Channel Island by G. Kanakoff.

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Family Pyramidellidae

We have the following letter from Mr. A.M. Strong and for convenience will run all of his keys first and then take up the discussion of the various species involved.

" I am inclosing copies of the keys to the principal subgenera in Turbonilla and Odostomia. These include all species that occur north of San Diego. I hope I have not ommited any.

In the subgenera where there are only one to four or five species in our list it hardly seems worth while to make out keys. However, if you think it best to have them to fill out the complete list it will be easy to make out such keys."

Turbonilla

Whorls with a low, rounded cord at the periphery..........gilli D. & B.
Length 3.3 mm. Monterey to San Diego Bull. 68-29, 2-3
Whorls without a cord at the periphery
. Whorls overhanging ....diegensis D. & B.
Length 5.3 mm. San Pedro to San Diego Bull. 68-31, 2-13
. Whorls not overhanging .... acra D. & B.
Length 10 mm. Off Catalina Island Bull. 68-32, 2-14

Chemnitzia

Adult large, more than 7 mm. in length
. Whorls well rounded .... hypolispa D. & B.
Length 8.1 mm. Catalina to San Diego Bull. 68-34, 2-5
. Whorls flattened ....gibbiana Cooper
Length 10 mm. Monterey Bull 68-35
Adult smaller, less than 7 mm. in length
. Summit of whorls tabulated .... aepynota D. & B.
Length 3.2 mm. San Pedro to San Martin Island Bull. 68-35,2-10
. Summit of whorls not tabulated
.. Intercostal spaces terminating posterior to the suture
... Axial ribs weak on the last whorl................santarosana D. & B.
Length 4.5 mm. Santa Rosa Island Bull. 68-36, 2-7
... Axial ribs strong on all whorls
.... Axial ribs on last whorl 16 ....engbergi Bartsch
Length 3.7 mm. Gulf of Georgia Proc. 70-5, 1-4
.... Axial ribs on last whorl 18 ....clarinda Bartsch
Length 4.7 mm. San Diego Proc. 42-264, 35-4
.. Intercostal spaces extending to the sutures
... Whorls narrowly shouldered at the summit
.... Axial ribs vertical ....muricatoides D. & B.
Length 3.0 mm. Monterey Bull. 68-38, 2-11
.... Axial ribs protractive .... kelseyi D. & B.
Length 4.7 mm. Santa Barbara to San Ignacio Bull. 68-39, 2-11
... Whorls almost appressed to the summit .... raymondi D. & B.
Length 5.2 mm. Santa Rosa Island to San Diego Bull. 68-39, 2-17

Strioturbonilla

Point Conception to San Diego

Intercostal spaces terminating posterior to the suture
. Intercostal spaces pinches in anterior to the suture ..dinora Bartsch
Length 9.2 mm. San Diego Proc. 42-264,35-8
. Intercostal spaces not pinched in anterior to the suture
.. Axial ribs exceedingly protractive................. buttoni D. & B.
Length 6.3 mm. Santa Rosa Island to Gulf of Calif. Bull.68-43,3-4
.. Axial ribs moderately protractive
... Whorls overhanging.................................asser D. & B.
Length 8.3 mm. Redondo to San Diego Bull. 68-45, 3-1
... Whorls not overhanging
.... Axial ribs obsolete on the body whorl........... attrita D. & B.
Length 7.4 mm. San Pedro to San Diego Bull. 68-46, 4-11
.... Axial ribs passing feebly over the periphery .....encella Bartsch
Length 4.5 mm. San Pedro Proc. 42-265, 35-1
.... Axial ribs well developed
..... Whorls slightly rounded, narrowly shouldered... bakeri Bartsch
Length 8.0 mm. San Diego Proc. 42-265,35-10
..... Whorls well rounded, not shouldered ....torquata Gould
Length 6.5 mm. San Pedro to San Diego Bull. 68-47, 4-15
.. Axial ribs vertical
... Axial ribs much enfeebled on the last whorl,,,,,carpenteri D. & B.
Length 7.9 mm. San Pedro Bull. 6849,3-9
... Axial ribs strong on all whorls
.... Axial ribs 16 on the body whorl.................. stimpsoni D. & B.
Length 6.7 mm. Redondo to San Diego Bull. 68-49, 3-11
.... Axial ribs 22 on the body whorl ....profundicola D. & B.
Length 6.3 mm. Off Catalina to off San Diego Bull.68-80,3-11
Intercostal spaces extending to the sutures
. Shell broadly conic
.. Axial ribs on body whorl 20 ....humerosa D. & B.
Length 6.0 mm. Catalina to San Diego Bull. 68-52, 3-10
.. Axial ribs on the body whorl 28 ....gallianoi D. & B.
Length 6.1 mm. San Diego to off Cape San Lucas Bull.68-51,4-12
. Shell slenderly conic
.. Periphery feebly angulated ....aresta D. & B.
Length 6.4 mm. Santa Rosa Island to San Diego Bull. 68-54, 4-5
.. Periphery and base well rounded.................. dracona Bartsch
Length 6.9 mm. San Diego Proc. 42-266, 35-2

North of Point Conception

Intercostal spaces terminating posterior to the sutures
. Axial ribs moderately protractive
.. Whorls overhanging ....vancouverensis D. & B.
Length 6.0 mm. Alaska to British Columbia Bull. 68-44, 4-9
.. Whorls not overhanging
... Whorls well rounded
.... Periphery and base well rounded ....stylina Carpenter
Length 6.5 mm. Monterey Bull.68-48,3-7
.... Periphery ontusely angulated ....barkleyensis Bartsch
Length 9.2 mm. Vancouver Island Proc. 52-641,44-9
... Whorls almost flattened .... canadensis Bartsch
Length 6.3 mm. Forrester Island Proc. 52-640,44-11
(con.)

. Axial ribs slightly retractive ....kincaidi Bartsch
Length 5.5 mm. Puget Sound Proc. 70-5, 1-3
Intercostal spaces extending to the sutures .... serrae D. & B.
Length 7.7 mm. Monterey Bull. 68-53, 4-3

Pyrgolampros
San Diego to Point Conception
Axial ribs poorly developed, obsolete on the last whorl ..halistrepta D. & B
Length 9.5 mm. Off Newport Bull. 68-72, 5-2
Axial ribs distinct on all whorls
. Shell short and stout ....ridgwayi D. & B.
Length 4.6 mm. San Diego Bull. 68-62, 6-10
. Shell elongate-conic
.. Shell unicolor
... Whorls well rounded ....lowei D. & B.
Length 7.2 San Pedro to San Diego Bull. 68-64, 6-11
... Whorls flattened on the sides
.... Ribs decidedly retractive ....tremperi Bartsch
Length 4.7 mm. San Diego Proc. 52-647, 44-7
.... Ribs vertical or slightly retractive
..... Ribs about 16 on the last whorl ....halibrecta D. & B.
Length 6.2 mm. Catalina Island Bull. 68-65, 5-10
..... Ribs 22 or more on the last whorl
...... Ribs weak, rounded .... gouldi D. & B.
Length 5.8 mm. Santa Rosa Island to San Diego Bull. 68-66, 6-1
...... Ribs strong
.... Periphery well rounded ....ilfa Bartsch
Length 10.5 mm. San Pedro Proc. 70-7, 1-1
.... Periphery obtusely angulated .... strongi Willett
Length 6.8 mm. Catalina Nautilus 45-67
.. Shell not unicolor
... Colors in two zones .... pedroana D. & B.
Length 7.0 mm. San Pedro to San Diego Bull. 68-67, 6-12
... Colors banded
.... Bands only visible on the outer lip............. chocolata Carpenter
Length 14.0 mm. San Pedro Bull. 68-70, 5-9
.... Bands visible on the spire and base
..... A single broad band covering the periphery
...... Axial ribs strongly retractive ....gloriosa Bartsch
Length 8.3 mm. San Diego Proc. 42-268, 35-9
...... Axial ribs slightly protractive................halia D. & B.
Length 8.5 mm. Santa Barbara to San Pedro Bull. 68-68, 6-8
..... Color bands double ....berryi D. & B.
Length 8.0 mm. Monterey to Catalina Bull. 68-69, 5-5
..... Color bands triple
...... Ribs about 22 on the last whorl.................. painei D. & B.
Length 7.3 mm. Catalina to San Diego Bull. 68-71, 5-4
...... Ribs about 30 on the last whorl .... keepi D. & B.
Length 11.7 mm. Catalina to San Diego Bull. 68-71, 5-1
Point Conception to Alaska
Axial ribs poorly developed, faint or obsolete on the last whorl
. Axial ribs reduced to mere lines of growth .... oregonensis D. & B.
Length 8.5 mm. Oregon and Washington Bull. 68-73, 5-5

(con.)

. Axial ribs more than mere lines of growth
.. Shell over 11 mm. long.............................lituyana D. & B.
Length 11.5 mm. Lituya Bay, Alaska Bull. 68-73, 5-8
.. Shell less than 9 mm. long
... Axial ribs retractive..............................rinella D. & B.
Length 8.5 mm. British Columbia Proc. 42-270,35-6
... Axial ribs vertical or nearly so
.... Flesh colored with a darker band ....franciscana Bartsch
Length 6.8 mm. San Francisco Bay Proc. 52-695, 42-2
.... Chestnut with a paler band ....peasa D. & B.
Length 6 mm. British Columbia Proc. 42-269,35-5
Axial ribs distinct on all whorls
. Shell short and stout
.. Shell unicolor
... Whorls excurved at the summit.....................victoriana D. & B.
Length 5.6 mm. British Columbia Bull. 68-61, 5-3
... Whorls not excurved at the summit.................valdezi D. & B.
Length 5.6 mm. Monterey Bull. 68-62,6-8
.. Shell banded ....newcombei D. & B.
Length 5.4 mm. British Columbia Bull. 68-63, 6-3
. Shell elongate conic
.. Shell unicolor ....taylori D. & B.
Length 6.5 mm. British Columbia Bull. 68-64, 6-7
.. Shell not unicolor
... Shell bicolor
.... Axial ribs 18 on the body whorl .... talma Bartsch
Length 9 mm. British Columbia Proc. 42-267, 35-7
.... Axial ribs 22 on the body whorl .... aurantia Carpenter
Length 5.8 mm. British Columbia Bull. 68-64, 6-4
... Shell banded
.... Band single, broad
..... Shell over 8 mm. in length
...... Axial ribs 18 on the last whorl .... stelleri Bartsch
Length 8.3 mm. Alaska Proc. 70-6, 2-4
...... Axial ribs 30 on the last whorl .... eyerdami Bartsch
10.5 mm. Alaska Proc. 70-9, 2-12
..... Shell less than 7 mm. in length
...... Axial ribs retractive............................lyalli D. & B.
Length 5-7 British Columbia Bull. 68-68,6-6
...... Axial ribs vertical or slightly protractive
.... Axial ribs 24 on the last whorl ....middendorffi Bartsch
Length 6.4 mm. Alaska Proc. 70-8, 2-2
.... Axial ribs 18 on the last whorl
.... Axial ribs curved ....shuyakensis Bartsch
Length 6.3 mm. Alaska Proc. 70-7, 2-1
.... Axial ribs straight
.... Axial ribs expanded at the suture...........pugetensis Bartsch
Length 4.0 mm. Seattle, Wash. Proc. 52-647, 44-4
.... Axial ribs not expanded at suture ....skogsbergi Strong
Nautilus 51-54
.... Band double.................................... alaskana D. & B.
Length 8.0 mm. Alaska Bull. 68-70, 6-9
.... Bands triple .... macouni D. & B.
Length 9 mm. British Columbia Proc. 42-268, 35-11

Pyrgiscus
San Diego and North
Axial ribs terminating anterior to the umbilical region
. Axial ribs terminating abruptly at the periphery
.. Shell broadly conic
... Incised spirals 6, of uniform strength........... vexativa D. & B.
Length 6.2 mm. San Pedro Bull. 68-77, 7-11
... Incised spirals 7, not uniform..................obesa D. & B.
Length 5.2 mm. Pacific Beach Bull. 68-78, 7-3
.. Shell elongate conic
... Shell large, adult over 12 mm. long
.... Summit of whorls narrowly shouldered .... nuttingi D. & B.
Length 12.3 mm. San Pedro to San Diego Bull. 68-79, 7-13
.... Summit of whorls appressed .... dora Bartsch
Length 13.8 mm. San Diego Proc. 52-649, 42-10
... Shell smaller, adult less than 5 mm. long ....callia D. & B.
Length 4.7 mm. San Diego Bull. 68-80, 7-4
. Axial ribs fading out before the middle of the base
.. Shell stout and very robust
... Axial ribs somewhat tuberculated ....pluto D. and B.
Length 7.5 mm. San Pedro Bull. 68-81, 9-9
... Axial ribs not tuberculated ....jewetti D & B
Length 5.5 mm. San Pedro to San Hipolito Point Bull. 68-82,7-2
.. Shell not stout and very robust
... Shell broadly conic
.... Incised lines of uniform strength
..... Shell large, adult more than 10 mm. long ....signae D. & B.
Length 10.2 mm. San Pedro Bull. 68-83, 7-1
..... Shell smaller, less than 7 mm. long
...... Base with incised spiral lines only
.... Axial ribs 20 on the last whorl..............morchi D. & B.
Length 6.4 mm. Catalina to San Diego Bull. 68-84, 7-6
.... Axial ribs 30 on the last whorl ....aragoni D. & B.
Length 7.0 mm. Monterey Bull. 68-85, 9-12
...... Base with incised spiral lines and fine striations..recta D. & B.
Length 3.6 mm. San Diego to Pt. Abreojos Bull. 68-85,7-12
.... Incised spiral lines not of uniform strength
..... Incised spirals all strong
...... Axial ribs 18 on the last whorl.................nereia D & B
Length 5.8 mm. San Pedro to San Diego Bull. 68-86, 8-11
...... Axial ribs 35 on the last whorl .... weldi D & B
Length 8.8 mm. San Pedro Bull. 68-86, 8-11
..... Incised spiral lines partly strong, partly fine
...... Shell large, adult more than 12 mm. long....... ista Bartsch
Length 12.5 mm. San Diego Proc. 52-650, 42-6
...... Shell smaller, less than 7 mm. long
.... Periphery and base well rounded .... eva Bartsch
Length 4.3 mm. San Diego Proc. 52-651, 44-5
.... Periphery angulated, base short
.... Axial ribs 22 on the last whorl
.... Whorls overhanging ....antemunda D & B
Length 6.9 mm. Santa Rosa to Catalina Island Bull.68-83,8-15
.... Whorls not overhanging .... ina Bartsch
Length 6.1 mm. San Diego Proc. 52-649, 44-10

.... Axial ribs 28 on the last whorl .... antestriata D & B

Length 9.7 mm. Esteros Bay to San Diego Bull.68-87,8-5

... Shell elongate-conic

.... Incised spirals all strong

..... Summit of whorls exserted .... tenuicula Gould

Length 7.5 mm. Monterey to Pt. Abreojos Bull.68-92,8-7

..... summit of whorls not exserted

...... Spacing of incised spirals regular .... virgo Carpenter

Length 4.8 mm. Santa Barbara Bull. 68-93, 8-4

...... Spacing of incised spirals not regular

.... Whorls flattened on the sides .... canfieldi D & B

Length 6.3 Monterey Bull. 68-95, 9-3

.... Whorls rounded

.... Whorls shouldered at the summit ....callimene Bartsch

Length 7.2 San Diego Proc. 42-271, 37-7

.... Whorls appressed at the summit ....almo D. & B.

Length 4.6 mm. San Diego Bull. 68-95, 9-8

.... Incised spirals not all strong

..... Summit of whorls exserted ....tenuicula Gould

Length 7.5 mm. Monterey to Pt. Sbreojos Bull. 68-92,8-7

..... Summit of whorls not exserted ....eucosmobasis D. & B.

Length 11.2 mm. San Luis Obispo to Santa Rosa Isl. Bull.68-98,10-11

Axial ribs extending to the umbilical region

. Base of last whorl decidedly inflated

.. Shell large, adult more than 10 mm. long ....castanea Keep

Length 10.5 mm. San Pedro to San Diego Bull. 68-100, 9-1

.. Shell smaller, adult less than 8 mm. long .... aurecoma D. & B.

Length 7.2 mm. San Pedro to Scammons Lagoon Bull. 68-101, 9-5

. Base of body whorl not inflated

.. Shell broadly conic

... Whorls shouldered at the summit .... adusta D. & B.

Length 5.7 mm. San Diego Bull. 68-108, 10-12

... Whorls not shouldered at the summit

.... Axial ribs broad and flattened .... castanella D. & B.

Length 13.5 mm. Monterey Bull. 68-102, 9-7

.... Axial ribs rounded, distinct .... burchi Gordon

Length 10.4 mm. Redondo Beach Nautilus 51-49

.. Shell elongate-conic

... Whorls narrowly shouldered at the summit .... delMontensis Bartsch

Length 9.7 Del Monte Proc. 70-9, 2-11

... Whorls slopingly shouldered on upper part

.... Shell milk white .... wickhami D. & B.

Length 8.0 mm. Catalina Island Bull. 68-106, 10-9

.... Shell golden brown ....grippi Bartsch

Length 11.00 mm. San Diego Proc. 42- 270, 36-9

Mormula

San Diego to Alaska

Varices present on the outside of the whorls

. Adult large, more than 13 mm. long

.. Shell conspicuously banded ....lordi E.A. Smith

Length 20.8 mm. Sitka to Puget Sound Bull. 68-111, 11-4

.. Shell not conspicuously banded

... Incised spiral lines 6 between the sutures .....regina D. & B.

Length 19.6 mm. Santa Rosa Isl. to San Pedro Bull. 68-112,11-1

... Incised spiral lines between the sutures more than 6
.... Incised spiral lines between the sutures 9.....catalinensis D. & B.
Length 16.5 mm. Catalina Island Bull. 68-113,11-10
.... Incised spiral lines 12 between the sutures.....eschscholizi D & B
Length 13.3 British Columbia Bull. 68-113,11-8
. Adult smaller, less than 12 mm. long
.. Incised spiral lines 5 or 6 between the sutures
... Periphery of the last whorl angulated .... tridentata Carpenter
Length 11.2 mm. Monterey to San Diego Bull. 68-114, 11-12
... periphery of last whorl rounded ....clementina Bartsch
Length 7.6 mm. San Clemente Island Proc. 70-11, 2-9
... Incised spiral lines 10 between the sutures ..... ambusta D. & B.
Length 10.0 mm. San Pedro Bull. 68-115, 11-13
varices absent from the soutside of the whorls
. Adult shell more than 11 mm. long ....enna Bartsch
Length 11.6 mm. San Pedro Proc. 70-10, 2-8
. Adult shell less than 10 mm. long
.. Adult shell more than 8 mm. long ....pentalopha D. & B.
Length 8.5 mm. San Pedro to Todos Santos Bay Bull. 68-117, 11-3
.. Adult less than 6 mm. long
... Axial ribs 28 on the last whorl ....heterolopha D. & B.
Length 5.5 mm. San Pedro to San Hipolito Pt. Bull. 68-118,11-9
... Axial ribs 14 on the last whorl ....periscelida D & B
Length 3.2 mm. Santa Rosa Island Bull. 68-119, 11-6

Chrysallida
Point Conception to San Diego

All spiral cords nodulous
. Sutures strongly channeled
.. Shell elongate-conic, slender
... Basal cords 4 ....heterocincta Bartsch
Length 3.2 mm. San Diego Proc. 42-274
... Basal cords 5 ....eugene D & B
Length 4.3 mm. San Pedro to San Hipolito Pt. Bull 68-166
... Basal cords 6 ....ritteri D & B
Length 4.5 mm. Catalina to San Diego Bull. 68-146
... Basal cords 8 ....tremperi Bartsch
Length 3.7 mm. San Clemente Island Proc. 70-14
.. shell broadly conic or ovate
... Basal cords 4 .... trachis D & B
Length 2.5 mm. Monterey to San Diego Bull. 68-148
... Basal cords 5
.... Shell large, adult 4 mm. long .... lucca D & B
Length 4 mm. Monterey to San Diego Bull. 68-148
.... Shell small, adult 2.3 mm. long ....clementina D. & B.
Length 2.3 mm. San Clemente Island Bull. 68-157
... Basal cords 6
.... Whorls slopingly shouldered ....oldroydi D & B
Length 3.5 mm. San Diego to Coronado Ids. Bull. 68-150
.... Whorls not shouldered ....cincta D & B
Length 3.0 mm. Santa Barbara to Pacific Beach Bull. 68-156

... Basal cords 7 ....vicola D & B
Length 2.5 mm. San Pedro Bull. 68-153
. Sutures not channeled
.. Spiral cords between sutures 4
... Basal cords 6 .... pulcia D & B
Length 2.2 mm. San Pedro Bull. 68-160
... Basal cords 10 or more ....virginalis D & B
Length 3.0 mm. San Pedro to Pt. Abreojos Bull. 68,-160
.. Spiral cords between sutures more than 4
... Axial ribs about 20 ....clemtensis Bartsch
Length 3.2 mm. San Clemente Island Proc. 70-15
... Axial ribs about 30 ....thalia Bartsch
Length 2.0 mm. Coronado Islands Proc. 42-275
All spiral cords not nodulous
. Anterior spiral cord smooth, rest nodulous
.. Shell large, adult 5 mm. in length ....pulcherrima D & B
Length 5 mm. San Pedro Bull. 68-169
. Anterior spiral cord smooth, rest nodulous
.. Shell small, 3 mm. or less in length
... Basal cords 5....................................vineta D & B
Length 2.7 mm. San Pedro Bull.68-1165
... Basal cords 7 ....catalinensis Bartsch
Length 3.1 mm. Catalina Island Proc. 70-17
. More than one cord smooth
.. Spiral cord between sutures 4
... Shell large, more than 4 mm. in length ....helga D & B
Length 4.2 mm. San Pedro to Coronado Islands Bull. 68-166
... shell small, adult less than 3.5 mm. in length ...dinella Bartsch
Length 3.0 mm. San Diego Proc. 42-274
.. Spiral cords between sutures more than 4
... shell elongate conic, slender ....virginalis D & B
Length 3.0 mm. San Pedro to Point Abreojos Bull. 68-160
... shell ovate ....sapia D & B
Length 1.8 mm. San Diego Bull 68-167

Chrysallida- North of Point Conception

All spiral cords nodulous
. Sutures strongly channeled
.. Basal cords 4 .... trachis D & B
Length 2.5 mm. Monterey to San Diego Bull. 68-148
.. Basal cords 5
... Whorls slopingly shouldered,......................lucca D & B
Length 4 mm. Monterey to San Diego Bull. 68-148
... whorls not shouldered ....chacei Bartsch
Length 2.9 mm. Monterey to Cayucos Proc. 70-16
.. Basal cords 7
... Anterior spiral cord the strongest ....euglypta Jordan
Length 2.1 mm. Trinidad Proc. 58-2
... All spiral cords equal in strength .... astricta D & B
Length 2.9 mm. Monterey to San Diego Bull. 68-154
.. Basal cords 8 ....cooperi D & B
Length 3.1 mm. Monterey Bull 68-159

(con.)

. Sutures not channeled

.. Spiral cords between the sutures 4

... Posterior spiral cord the weakest............cumshewaensis Bartsch
Length 2.7 mm. British Columbia Proc. 70-13

... All spiral cords equal in strength ....montereyensis D. & B.
Length 3 mm Monterey Bull. 68-159

.. spiral cords between the sutures more than 4 ...oregonensis D & B
Length 3.3 mm. B.C. to Monterey Bull. 68-162

Menestho- San Diego to Alaska

Shell elongate-conic ....pharcida D & B
Length 2.2 mm. British Columbia Bull. 68-185,21-5

shell elongate- ovate or ovate

. Last whorl with about 40 spiral cords ....exarta D & B
Length 3.9 mm. Monterey Bull. 68-186,21-1

. Last whorl with much less than 40 spiral cords

.. Spiral cords 3 between the sutures ....gloriosa Bartsch
Length 3.1 mm. San Diego to San Hipolito Pt. Proc. 42-276,36-2

.. spiral cords more than 3 between the sutures

... spiral cords 4 between the sutures

.... Basal cords 3 ....amilda D & B
Length 2.6 mm. San Diego to Round Island Bull. 68-186,21-4

.... Basal cords more than 3

..... Basal cords 4

...... Spiral sculpture very strong ....farma D & B
Length 2.4 mm. Catalina Island Bull. 68-188,20-1

...... Spiral sculpture very feeble ....enora D & B

.... Basal cords more than 4

..... Spiral cords equally spaced ....fetella D & B
Length 4.4 mm. San Pedro to San Ignacio Lagoon Bull. 68-189,21-9

..... Spiral cords unequally spaced ....excisa Bartsch
Length 3.9 mm. Catalina Island Proc. 42-276, 36-8

.... Spiral cords 6 between the sutures

..... Basal cords 5 ....hapocurta D & B
Length 4.3 mm. Alaska Bull. 68-190, 21-8

..... Basal cords 8 ....harfordensis D & B
Length 3.2 mm. Port Harford Bull. 68-191, 21-3

Amaura- San Diego to Alaska

Shell umbilicated

. Shell very large, adult over 10 mm. long

.. Shell very elongate-ovate ....lastra D & B
Length 13.6 mm. Catalina to San Diego Bull. 68-219,28-7

.. Shell broadly ovate ....kennerleyi D & B
Length 10.2 British Columbia Bull 68-219,28-8

. shell smaller, adult less than 10 mm. long

.. Shell ovate

... Summit of whorls concavely shouldered ....elsa D & B
Length 6.1 mm. Alaska Bull. 68-220, 29-1

... Summit of whorls flatly shouldered

.... Shell widely umbilicated ....beringi Dall
Length 5.7 mm. Alaska Bull. 68-220, 27-8

.... shell very narriwly umbilicated................subglobosa Bartsch
Length 6.0 mm. San Diego Proc. 42-286,37-2

.. shell elongate-ovate

... Umbilicus wide, open

.... summit of whorls tabulatedly shouldered ......farallonensis D & B
Length 5.5 mm. Off Farallones Bull 68-221,27-7

.... Summit of whorls faintly shouldered

..... Columella reflected over edge of umbilious ...satura Carpenter
Length 6.4 mm. Neah Bay, Wash. Bull. 68-221, 27-1

..... Columella not reflected over umbilicus ....helena Bartsch
Length 5.3 mm. San Pedro Proc. 42- 286, 38-10

... Umbilicus very narrow

.... summit of whorls appressed ....sillana D & B
Length 5.6 mm. Unalaska Bull 68-222, 28-9

.... Summit of whorls shouldered

..... Shoulder concave ....talpha D & B
Length 8.0 Mole Harbor, Alaska Bull 68-222, 27-9

..... Shoulder flat or rounded

...... Whorls strongly contracted at the suture .... krausei Clessin
Length 9.9 mm. Alaska Bull. 68-223, 29-5

...... Whorls not strongly contracted at the suture

.... Adult shell over 9 mm. in length ....eldorana Bartsch
Length 9.1 mm. Kodiak Island, Alaska Proc. 42-287, 38-12

.... Adult shell less than 9 mm. in length

.... Surface with fine spiral lirations ....grippiana Bartsch
Length 7.5 mm. British Columbia Proc. 42-287, 38-11

.... Surface without spiral lirations

.... Columella strongly curved ....orcia D & B
Length 7.7 mm. Santa Rosa Island Bull. 68-223, 27-3

.... Columella very oblique ....gouldi Carpenter
Length 6.1 mm. Neah Bay, Wash. Bull. 68-224, 27-2

shell not umbilicated

. Shell very large, adult over 12 mm. in length ...arctica D. & B.
Length 12.4 mm. Arctic Ocean Bull 68-224,28-5

. shell smaller,adult less than 10 mm. in length

.. Shell ovate

... Summit of whorls appressed ....nuciformis Carpenter
Length 7.7 mm. Neah Bay, Wash. Bull. 68-227, 28-1

... Summit of whorls shouldered

.... Adult shell more than 6 mm. long

..... Summit of whorls with a beveled shoulder ...... canfieldi Dall
Length 9.6 mm. Monterey Bull. 68-228, 28-2

..... Summit of whorls with a tabulated shoulder ....subturrita D. & B.
Length 6.9 mm. Santa Barbara to Todos Santos Bay Bull 68-228,28-4

.... Adult shell less than 6 mm. long ....martensi D & B
Length 5.3 Alaska Bull 68-229, 29-3

.. Shell elongate-ovate

... surface of shell finely spirally lirate.........moratora D & B
Length 9.5 mm. Off Point Reyes Bull. 68-225, 30-7

... surface of shell not finely lirate

.... Summit of whorls appressed.....................avellana Carpenter
Length 8.3 mm. Neah Bay, Wash. Bull. 68-225,28-3

.... Summit of whorls shouldered
..... Aperture pearshaped ....illiuliukensis D & B
Length 9.5 mm. Unalaska Bull. 68-227, 29-4
..... Aperture ovate
...... Whorls broadly shouldered ....washingtona Bartsch
Length 8.6 mm. San Juan Island, Wash. Proc. 70-20, 4-10
...... Whorls narrowly shouldered
.... Periphery of last whorl inflated
.... Shell broadly elongate-ovate ....pasa D & B
Length 9.3 mm. Kodiak Island, Alaska Bull. 68-226,29-2
.... Shell narrowly elongate-ovate ....engbergi Bartsch
Length 7.0 mm. San Juan Island, Wash. Proc. 70-21, 5-5
.... Periphery of last whorl rounded, not inflated
.... Shell broadly elongate- ovate ....nota D & B
Length 7.5 mm. Santa Rosa Island to San Diego Bull. 68-226
.... Shell narrowly elongate-ovate ....sanjuanensis Bartsch
Length 7.2 mm Olga, Wash. Proc. 70-2-, 2-6

Odostomia, subgenus Evalea Monterey to Bering Sea
Shell umbilicated
. Spiral sculpture consisting of incised lines and raised lirations
.. Lirations confined to the base ....septentrionalis D & B
Length 4.6 mm. Unalaska Bull 68-200,26-9
.. Lirations on base and spire ....capitana D & B
Length 4.6 mm. Kodiak Island 68-200,26-7
. Spiral sculpture consisting of incised lines only
.. Columellar fold in the middle of the columella..nunivakensis D & B
Length 3.0 mm. Nunivak Island, Alaska 68-194,22-6
.. Columellar fold posterior to the middle of the columella
... Spiral sculpture strong
.... Shell thick and robust
..... Summit of whorls narrowly tabulated ....youngi D & B
Length 6.5 mm. Barkley Sound, B.C. 42-277,37-6
..... Summit of whorls not tabulated ....killisnooensis D & B
Length 6.4 mm. Killisnoo, Alaska 68-195, 22-7
.... Shell thin and delicate
..... Shell broadly tabulated at the summit......vancouverensis D & B
Length 4.7 mm. Barkley Sound, B.C. 42-280, 37-1
..... Whorls not tabulated at the summit
...... Incised lines strongest anteriorly ....spreadboroughi D & B
Length 3.3 mm. Barkley Sound, B.C. 42-279, 38-8
...... Incised lines equal on all whorls......tillamookensis D & B
Length 4.1 mm. Tillamook, Oregon 68-195, 22-2
... Spiral sculpture very fine
.... Shell very broadly conic
..... Suture strongly contracted ....aleutica D & B
Length 4.4 mm. Bering Sea to Unalaska 68-196, 22-5
..... Suture not strongly contracted
...... Whorls moderately shouldered at the summit ...quadrae Bartsch
Length 6.2 mm. Barkley Sound, B.C. 42-281, 37-3
...... Whorls not shouldered ....kadiakensis D & B
Length 5.2 mm. Kodiak Island, Alaska 68-197, 22-9

.... Shell elongate conic
..... Whorls narrowly tabulated at the summit
...... Periphery of last whorl inflated ....hypatia Bartsch
Length 5.2 mm Skidegate, Alaska 42-282,37-5
...... Periphery of last whorl not inflated.....cypria Bartsch
Length 4.0 mm. Skidegate, Alaska 42-282,37-7
..... Whorls not tabulated
...... Periphery of last whorl subangulated
.... Shell narrowly elongate conic ....barkleyensis D & B
Length 3.1 mm. Barkley Sound, B.C. 42-283, 38-9
.... Shell very broadly elongate conic .....franciscana Bartsch
San Francisco Bay 52-665, 45-7
...... Periphery of last whorl well rounded
.... Whorls roundly shouldered ....valdezi D & B
Length 3.0 mm. Del Monte, Calif. 68-198, 23-6
.... Whorls not shouldered.................cookeana D & B
Length 3.2 mm. Ellamar, Alaska 42-283,37-8
Shell not umbilicated
. Incised lines strong over the entire surface
.. Periphery of last whorl subangulated ....inflata D & B
Length 6.2 mm. Neah Bay, Wash. 68-201, 23-7
.. Periphery of last whorl rounded
... Shell elongate conic ....columbiana D & B
Length 8.3 mm. Vancouver to Port Townsend 68-202,23-1
... Shell elongate ovate ....unalaskensis D & B
Length 4.8 mm. Unalaska 68-203, 26-5
. Incised lines strong on early whorls only
.. Shell pure white, semitransparent ....phanea D & B
Length 4.8 mm. Monterey 68-204, 23-5
.. Shell not white and semitransparent
... Periphery of last whorl rounded, inflated ....tenuisculpta Carpenter
Length 5.3 mm. Washington to Port Harford 68-206, 23-2
... Periphery of last whorl feebly angulated .....willetti Bartsch
Length 5.8 mm. Prince of Wales Island, Alaska 52-666,43-6
. Incised spiral lines only moderately strong
.. Periphery of last whorl very strongly angulated ...angularis D & B
Length 5.6 mm. Sitka to Puget Sound 68-207, 24-6
.. Periphery of last whorl well rounded
... Shell very broadly conic ....tacomaensis D & B
Length 4.3 mm. Tacoma, Wash. 68-209, 24-8
... Shell elongate conic
.... Adult shell very small ....amchitkana D & B
Length 3.5 mm. Amchitka, Alaska 68-210, 24-7
.... Adult shell larger ....stephensi D & B
Length 5.3 mm. Baranoff Island 68-210, 24-5
... Shell elongate ovate
.... Whorls slightly shouldered.................eyerdami Bartsch
Length 4.5 mm. Afognak Island 70-18, 4-1
.... Whorls not shouldered......................classini D & B
Length 6 mm. Baranoff Island 68-211,24-4
. Incised lines very fine
.. Summit of whorls tabulated ....baranoffensis D & B
Length 6.3 mm Baranoff Island 68-215, 25-3

.. Summit of whorls not tabulated
... Shell broadly conic
.... Columella almost straight ....sitkaensis D & B
Length 4.0 mm. Sitka 68-215, 26-3
.... Columella strongly curved ....hagemeisteri D & B
Length 4.4 mm. Bering Sea 68-216, 36-1
... Shell elongate ovate
.... Periphery feebly angulated ....skidegatensis D & B
Length 3.4 mm Skidegate 42-284,38-7
.... Periphery well rounded ....delicosa D & B
Length 4.0 mm. Monterey 68-216,26-3
... Shell ovate, with tabulate whorls ....cassandra D & B
Length 2.5 mm. Skidegate 42-285, 38-5

The figures under the species named refer to the Bulletin or Proceedings of the U.S. National Museum and the page. Also the plate and figure.

The following species have been reported from the Monterey area: valdezi D & B, phanea D & B, tenuisculpta Carpenter, delicosa D & B.

Odostomia, subgenus Evalea- San Diego to Santa Barbara, Calif.
Shell umbilicated
. Spiral sculpture distinct
.. Spiral lines strong on early whorls, fading out on last..thea Bartsch
Length 4.7 mm. San Pedro 42-278,37-7
.. Spiral lines strong on all whorls
... Shoulder of whorls strongly tabulated.........calliope Bartsch
Length 4.2 mm. Off Pt. Loma, 110-100 fms. 42-278,36-10
... Shoulder of whorls not strongly tabulated
.... Shell very broadly elongate-conic ....caloarella Bartsch
Length 3.3 mm. Off Santa Rosa Island, 48 fms. 42-279,37-4
.... Shell elongate ovate.........................esilda D & B
Length 5.5 mm. Off San Diego, 359 fms. 68-196,22-1
. Spiral sculpture microscopic
.. Shell elongate conic
... Summit of whorls narrowly tabulate ....heralda D & B
Length 2.8 mm. Off San Diego 68-197,23-8
... Summit of whorls not tabulate
.... Periphery inflated, rounded
..... Whorls somewhat constricted at the summit.....callimene Bartsch
Length 3.1 mm. Off San Pedro, deep water 42-281,38-2
..... Whorls roundedly shouldered at the summit....nemo D & B
Length 4.8 mm. San Pedro to San Diego 68-198,22-8
.... Periphery faintly angulated ....io D & B
Length 5.6 mm. Santa Rosa Island
.. Shell ovate
... Summit of whorls slopingly shouldered ....pratoma D & B
Length 2.9 mm. Off Santa Rosa Island, 53 fms. 68-199,23-4
... Summit of whorls appressed ....bachia Bartsch
Length 3.6 mm. San Clemente Island 70-17, 2-7
Shell not umbilicated
. Incised lines strong on all whorls ....jewetti D & B
Length 4.1 mm. Santa Barbara 68-201,23-3

• Incised lines strong on early whorls only
•• Shell broqdly ovate
••• With raised lirations on the body whorl ....atossa Dall
Length 6.5 mm. San Pedro 68-203,26-8
••• Without raised lirations ....obessa D & B
Length 6 mm. San Pedro 68-203, 26-4
•• Shell elongate ovate
••• Shell white, semitransparent ....phanella D & B
Length 3.3 mm. San Pedro 68-205,23-9
••• Shell not white and semitransparent
•••• Incised lines on second whorl 15.............tenuisculpta Carpenter
Length 6.3 mm. B.C. to Catalina 68-206
•••• Incised lines on second whorl 7 to 10
••••• Subsutural incised lines heaviest ....whitei Bartsch
Length 2.2 mm. San Pedro 70-11-19,4-3
••••• Without a heavy subsutural line
•••••• Body whorl with fine spiral lirations........santarosana D & B
Length 4.9 mm. Santa Rosa Island 68-205, 26-6
•••••• Body whorl without spiral lirations ....strongi Bartsch
Length 3.5 mm. Catalina Island 70-11-19,4-4
• Incised lines only moderately strong
•• Periphery subangulated
••• Posterior angle of aperture with a weak notch...baldridgeae Bartsch
Length 5.6 mm. San Pedro 42-284,38-1
••• Posterior angle of aperture without a notch
•••• Adult shell 5.5 mm. long......................donilla D & B
San Pedro to Todos Santos Bay 68-208,24-3
•••• Adult shell 3 mm. long ....californica D & B
San Diego 68-208,24-2
•• Periphery of last whorl well rounded ....sorilla D & B
Length 4.8 mm. Off San Diego 68-209,24-9
• Incised spiral lines exceedingly fine
•• Periphery of last whorl strongly angulated
••• Shell narrowly conic ....minutissima D & B
Length 3.1 mm. San Diego to Pt. Abreojos 68-211,25-4
••• Shell broadly conic...........................raymondi D & B
Length 3.6 mm. Off Catalina Island
•• Periphery of last whorl subangulated ....
••• Shell large,adult more than 6.5 mm in length ....dravida Gould
Length 6.6 mm. Santa Barbara 68-212,25-7
••• Shell small,adult less than 4 mm. in length
•••• Shell elongate ovate
••••• Summit of whorls subtabulated ....notilla D & B
Length 2.7 mm Off Catalina Island 68-213,25-6
••••• Summit of whorls slopingly shouldered ....movilla D & B
Length 3.6 mm. Off San Diego, 359 fms. 68-213,25-1
•••• Shell ovate ....altina D & B
Length 3.0 mm. Off San Diego, 359 fms. 68-214,24-2
•• Periphery of last whorl well rounded
••• Summit of whorls tabulated.................profundicola D & B
Length 4.5 mm. Off San Diego, 359 fms. 68-214,25-8
••• Summit of whorls not tabulated
•••• Whorls inflated,strongly rounded .... resina D & B
Length 2.2 mm. Arch Beach 68-216, 27-6

(con.)

.... Whorls flattened in the middle ....*nemo* D & B
Length 4.8 mm. San Pedro to San Diego 68-198,22-8

Only one of these species, *Odostomia* (*Evalea*) *tenuisculpta* Carpenter has been reported north of Santa Barbara.

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It has been our custom to republish all descriptions since the publication of Oldroyd in order to make these papers as near a complete supplement as possible to that great work. Inasmuchas there are a number of such species in this group the descriptions will follow without regard to order. Our discussions will follow with references back to these descriptions.

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Turbonilla (*Strioturbonilla*) *cayucosensis* Willett,1929. Nautilus 43:26,27 pl.8, figs. 2,3. " Shell large, broadly elongate-conic, bluish white in younger specimens, yellowish white in adults. Nuclear whorls small, rounded, having their axis at right angles to the succeeding turns. Post-nuclear whorls somewhatv flattened and shouldered at the summits. Surface marked by heavy, rounded, closely spaced, strongly protractive axial ribs, of which fourteen occur on each of the first eight whorls,sixteen on the 9th and 10th, 18 on the 11th, and 20 on the 12th and last whorl. These ribs extend from the summit of the whorl to the periphery, where they mergeand terminate. Intercostal spaces a little narrower than the ribs, also terminating at the periphery. On the type and other adult specimens the axial ribs extend over the base, becoming more or less feeble and uneven on the anterior portion. In immature specimens (ten whorls or less) the ribs terminate at the periphery. Entire base and spire covered with fine spiral striations, visible only under a fairly strong lense. Aperture oval,posterior angle narrowly, obliquely truncated by the flattened summit. Outer lip thin,slightly contracted; inner lip slightly oblique and somewhat reflected . The type has 12 post nuclear whorls and measures :- Length 9 mm, diam. 2 mm.

The type, No. 1016, Coll. Los Angeles Museum, and 24 additional specimens were taken by Mr. H.N. Loweunder stones at Cayucos, Calif. June, 1927.

Remarks: In general shell characters this species seems to resemble *T. attrita* Dall and Bartsch. It is easily differentiable from this species however, by its larger size, as well as by its more protractive and different number of ribs. A study of the type species shows some individual variation in the width of the ribs and in their number. While most of the specimens are like the type in the latter character, in some specimens the increase in number of ribs occurs one whorl earlier.

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Turbonilla (*Pyrgolampros*) *strongi* Willett,1931. Nautilus 45:67, pl.14, f.4. " Shell very slender: chocolate brown (nuclear whorls decollated). Post-nuclear whorls almost straight along the sides; only very slightly rounded toward the shouldered summit and the periphery, marked by strong,rounded, slightly protractive axial ribs, of which there are 18 on the first and second, 16 on the third to sixth, 18 on the seventh, 20 on the eighth and ninth, and 24 on the tenth (last) turn. Intercostal spaces two or three times as wide as the ribs. Periphery of the last whorl obtusely angulated, marked by the continuations of the axial ribs, which remain strong to the columellar region. The type, No. 1019 Coll. of the Los Angeles Museum, has ten post-nuclear whorls, and measures: Length, 6.8 mm.; diam. 1.6 mm.

(con.)

It was taken by the writer in 25 fathoms off the north shore of Catalina Island,1920. A smaller specimen taken at the same time is in the writer's collection. Remarks: This species is proportionally the most slender of our known west American Pyrgolampros. In dimentions it more nearly resembles some of the slender species of the subgenus Turbonilla. It is probably as close to T. halibrecta Dall and Bartsch as to any member of it's subgenus. From this species it differs markedly in more slender proportions, different number of axials and their much stronger continuation on the base.

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Turbonilla (Pyrgolampros) skogsbergi Strong,1937 Nautilus 51:54,pl4,f.3 " Holotype: Stanford Univ. Paleo. Type Coll. No. 6054. Paratype: Stanford Univ. Paleo. Type Coll. No. 6055. Type locality: Monterey Bay, five miles north of Monterey, California , at a depth of 28 fathoms.

" Shell slender, acutely conic, shining, whitish, with, beginning on the third or fourth whorl, a brown band covering the anterior third of the whorls between the sutures and extending over the periphery to the middle of the base; nuclear whorls small, depressed, not immersed, having their axis at right angles to that of the following whorls; postnuclear whorls moderately rounded, sutures distinct; axial sculpture consisting of about 18 broad, nearly straight, slightly protractive ribs which extend from suture to suture but fade out just below the periphery, with shallow, narrower interspaces; spiral sculpture of numerous, fine, closely-spaced, striations over the entire surface; periphery well rounded; base rather short, well rounded; aperture subquadrate,posterior angle acute,outer lip thin, showing the brown color band within; columella slender nearly straight. The holotype has lost the nucleus and first postnuclear whorl, the remaining 8 whorls measure: length 5.6, maximum diameter , 2.0 mm. The description of the nucleus was taken from an immature paratype of 5 whorls which measures length 2.5, maximum diameter, 0.8 mm. Comparison: This species is nearest to Turbonilla (Pyrgolampros) newcombei Dall and Bartsch from British Columbia , differing principally in the wider ribs and shorter base. "...

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Turbonilla (Pyrgiscus) burchi Gordon,1938. Nautilus 52:49,50, pl.4, figs. 3-5. " Shell large,broadly-conic, flesh-colored with a wide brown band which extends from one fourth the distance from the suture to the periphery, to one fourth the distance from the periphery to the columella. Early nuclear whorls broken away; remaining half turn smooth, slightly oblique, and slightly immersed in the first post-nuclear whorl. Post nuclear whorls rounded, slightly appressed at the summit, marked on the early whorls by rather strong, almost vertical, rounded, axial ribs, which become slightly retractive on the last three whorls. of these there are 14 on the third, 16 on the fourth to sixth, 17 on the seventh, 18 on the eighth,20 on the ninth, 22 on the tenth, and 28 on the last whorl. The spiral sculpture consists of heavily incised lirae or elongated pits and finely incised lines. There are five rows of the elongated pits; the first, second , and fourth of equal strength, and the third and fifth slightly stronger. The first of these marks the posterior boundary of the brown color band, the second is just anterior to it, the fifth is almost at the periphery, the fourth is the same distance posterior to it as the first to the second, and the third is half way between the second and fourth. The flesh-colored area in front of the suture is marked by five finely incised lines of equal strength and equidistant except for the third and fourth which are set s slightly farther apart. There are two finely incised lines between the first

(con.)

and second rows of spiral pits, two between the second and third, three between the third and fourth, and none between the fourth and fifth. The spiral sculpture does not cross the summits of the axial ribs though several of the rows of spiral pits encroach well upon the slopes. The periphwry is well rpunded and marked by a smooth area as wide as that separating the fourth and fifth rows of spiral pits. A few of the axial ribs cross the periphery but these evanesce quickly. The base is well rounded and marked by eighteen fairly strong, subequal, spiral grooves which are unequally spaced. Aperture moderately large, rhomboidal; posterior angle acute; outer lip thin, showing the sculpture within; columella moderately thin, oblique, revolute, but almost straight; parietal wall covered by a thin callus. The type posseses eleven whorls and measures : height, 10.4, greatest diameter, 2.9 mm.
Holotype: No. 1057 Los Angeles Museum coll. dredged at 25 fathoms in gravel one mile west of the pier at Redondo Beach, Calif. by M. Gordon and J.Q. Burch in June,1938.

A study of the paratypes shows that the finely incised spiral lines do not constitute a constant character, the specimen in the author's collection possessing twelve of these in the flesh-colored zone anterior to the first row of spiral pits. The rows of spiral pits, however, are a always five in number though varying in strength from the type, and are especially apparent on the earlier post-nuclear whorls.

The species is evidently most closely related to Turbonilla (Pyrgiscus) dora Bartsch but differs from that species in being banded, in having stronger and less numerous axial ribs on all the whorls, less appressment at the suture, a different pattern of spiral sculpture, and not as many spiral grooves on the base.

The species is named for Mr. John Q. Burch of Redondo Beach, Calif.

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Odostomia (Chrysallida) ornatissima (Haas),1943. Described as Chrysallida (Chrysallida) ornatissima - Zoological Series of the Field Museum of Natural History, vol. 29, no. 1, 1943, pp 4-5, pl,2, figs a,b,c.
" Type from Point Pinos, Monterey Peninsula, California; washed from sand in a tide pool. No. 17029 Field Museum of Natural History. Collected May 19,1941, by Fritz Haas.
Diagnosis.- A medium sized species of the typical subgenus of the pyramidellid genus Chrysallida , charaacterized by a slender conic shell, an upper constriction of the whorls, and a peculiar pattern of shell sculpture.
Comparisons: The presence of only three keels on the nuclear whorl suggests a closer relation to species like C. oregonensis Dall and Bartsch, but the sculptural pattern of the post-nuclear whorls is quite different from that present in the group mentioned. It closely resembles the patt rn seen in species like C. oldroydi Dall and Bartsch, but these differ in having five keels developed on their nuclear whorls. The classification of the species of Chrysallida is still rather artificial, being based on unstable characters, such as the mutual relation of spiral or axial sculptural elements', and the preponderance of one or the other, so that the relation of the new form with any of the many congeneric species can not yet be stated.
Description of type.- Shell elongate-conic, shiny white, composed of five and one half whorls which increase gradually. Nuclear whorls one and one half, with three keels, the upper of which forms a sharp edge (fig.2c); the first half of the nuclear whorls is immersed(fig.2 b). The four post-nuclear whorls are a little inflated, the two upper ones with almost straight

sides, the two lower ones with rounded sides. They are separated by a deeply incised suture. The upper part of every post-nuclear whorl shows a narrow but decided and almost concave constriction. The shell is highly ornamented by a sculpture in which axial and spiral elements are almost equal; only on the base of the last whorl does the spiral element predominate. There are three spiral cords on the first and on the second post-nuclear whorls, four on the thirs and five on the fourth, while the base of the shell shows about seven. All these cords are separated by sharply incised furrows about one half as wide as the cords themselves; on the base of the shell only, those incised lines are much narrower in proportion to the cords. This system of revolving cords is crossed by axial furrows approximately as wide as the incised spiral furrows, but not as deep as these; this means that the points of crossing of spiral cords and axial furrows are at a higher level than the bottom of the incised lines. The consequence of this intersection of both spiral and axial elements is a meshwork presenting the edges of the cords cut into almost square, but obtuse angled raised knobs. The lower cords of every whorl are less heavily carved than the upper ones; thus the fourth on the third whorl and the fifth on the fourth whorl are practically intact and have only a somewhat wavy outline, while the cords on the base exhibit almost no intersecting furrows. The aperture of the shell is comparatively small, oval, and simple; its right upper margin, close to the insertion, is somewhat damaged in the type. In the interior of the aperture, the external shell sculpture is somewhat visible. The base of the aperture is decidedly effuse; its left margin is so closely appressed to the base of the shell that no trace of a secondary umbilical chinck can be seen. The columella presents a very faint, hardly visible fold.

Measurements:- Height 2.7 mm., width 1.25 mm., height of aperture 1 mm.

Notes on the paratype.- No. 17030 Field Museum of Natural History. Same locality, same date and same collector as the type. Its measurements are height 2.9 mm., width 1.3 mm, height of aperture 1.1 mm. The paratype matches the description of the type perfectly, with the exception that, being higher, it has an additional fraction of a whorl (about one fourth). Its aperture is a little damaged, somewhat more so than in the type.

Discussion.- The West Coast species of Chrysallida, whose number was 50 when Dall and Bartsch wrote their Monograph of West American Pyramidellid Mollusks, may be double that number now. The species are generally easily recognized, since the respective sculptural patterns offer distinctive features together with differences in the general shape of the shell. It has not yet been possible to split this mass of species into natural groups, the characters used for specific distinction being, apparently, either unstable or of only secondary value. The number of keels on the phylogenetically oldest part of the shell, the nuclear whorls, might prove to be a useful means for defining natural groups. In Chrysallida ornatissima the pattern of sculpture closely resembles, in a general way, that of C. oregonensis Dall and Bartsch , except that the raised parts in ornatissima are impressed in oregonensis, and vice versa. Three main features characterize ornatissima : the presence of three keels on the nuclear whorls, the slender, constricted shape of the whole shell, and the type of meshwork pattern of the sculpture. No other species of Chrysallida appears to possess this combination, though the separate features, or combinations of two of them, occur in numerous species.

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Pyramidellidae

Pyramidella Lamarck,1799. Type.(by monotypy), Trochus dolabratus L. " Shell of many whorls,turrited, umbilicated; columella with three folds; outer lip usually reinforced within, at irregular intervals, by spiral lamellar thickenings. The sculpture consists of mere lines of growth and very fine spiral striations." (Dall & Bartsch,1909, p. 19)

Subgenus Longchaeus Morch,1875. Malak. Blatt, vol. 22,1875,p.158. Type (fide Dall and Bartsch) , Pyramidella punctata Schubert and Wagner. . " Shell elongate-conic, not umbilicated, having three columella folds, a basal fasciole and p ripheral sulcus. The entire surface is marked by fine lines of growth and microscopic spiral striations." (Dall & Bartsch).

Key to Species of the Subgenus Longchaeus (from Dall & Bartsch,1909, p.21).
Shell variegated ....adamsi
Shell not variegated
  Shell rose-purple anteriorly ....bicolor
  Shell brown
    Adult shell more than 18 mm. long .... .mexicana
    Adult shell less than 14 mm. long
      Sutures very strongly channeled ....conica
      Sutures moderately chanalled ....mazatlanica

Pyramidella adamsi Carpenter,1864. San Pedro (Lowe) south to Salina Cruz, Mexico (Lowe). Type locality: " from a species of Chama at Mazatlan.".

In spite of the above key to species it is my personal opinion that it is impossible to separate the Pyramidella of the California fauna into more than one species. Our experience has been to take many specimens of Pyramidella from Newport Bay,Orange Co., and also from Mission Bay, San Diego Co. on eel grass, and also in abundance from Todos Santos Bay, Lower California. While it is quite possible that I have before me several species I will be sincerely obliged to anyone who will show me how to separate them.

Grant and Gale, 1931, p. 866 were disposed to place P. conica variegata in the synonymy of mexicana.

I am disposed to place at least P. mexicana (Dall and Bartsch)1909 in the synonymy. (Burch).

In response to the above suggestion it was approved by Mr. E.P. Chace and several other members of the club. However, Mr. A.M. Strong in his notes seems to list both adamsi Carpenter (Newport Bay, subfossil) and P. mexicana Dall and Bartsch (Todos Santos Bay).

Collecting data: " Plentiful in July and August 1942, have been uncommon since... in Mission Bay, near Crown Point and the Causoway. By the way, how do you tell this from P, mexicana D. & B. ?" (W.K. Emerson); Estero, 10 miles S. of Ensenada; Salina Cruz,Mex. ; San Pedro, Calif. (Lowe); San Diego (Dr. F. Baker);

Pyramidella mazatlanica (Dall and Bartsch),1909. San Diego to Cape Tepoca, West Mexico. Type locality: off Cape Tepoca in 14 fathoms.

The San Diego record for this species should certainly be confirmed . No member reports it from California, and the records of the San Diego Museum of Natural History show only southern localities.

Collecting data: Conception Bay, L.C.; Magdalena Bay; Angel de la Guardia Island, Gulf of Calif. in 20 fms.; Punta Penasco in 10 fms.; Acapulco,Mexico in 20 fms. (Lowe); Espiritu Santo Island, Gulf of Calif. . (Baker).

Genus Peristichia Dall,1889. Type (by original designation): P. toreta Dall,1889.

Dr. Harald Rehder in Proc. U.S. National Museum, vol. 93, p. 195, 1943 in his discussion of the type of this genus also states that " other known species is Ividella pedroana Dall and Bartsch,1909." Dr. Rehder discusses the genus as follows: " Originally proposed as a genus of dubious affinities, Dall later placed Peristichia in the Pyramidellidae near Oscilla. Bartsch (Proc. Biol. Soc. Wash., vol. 17, p.9, Feb.5,1904) considered it a subgenus of Turbonilla. Thiele,1929, does not mention it at all, and Wenz (Handb. Palaozool. vol.6, p. 874,1940) lists it as a subgenus of Turbonilla with a question. An examination shows that it is a pyramidellid close to Triptychus and should be accorded full generic rank. It differs from Triptychus in having only one basal entrant spiral cord, instead of two, and in lacking columellar folds."

Mr. A.M. Strong, Mr. Allyn G. Smith and others of our club agree that we should follow Dr. Rehder on this.

Peristichia pedroana (Dall and Bartsch),1909. San Pedro, Calif. to Scammons Lagoon, L.C. Type locality: San Pedro.

Dr. Dall in Bulletin 112 placed this species under Odostomia, subgenus Ividella. This has often been questioned by students of the group. Mr. A.G. Smith comments " I've always thought this was completely out of place in Odostomia. Would follow Rehder on this."

Collecting data: Dredged off Catalina Island, Avalon in 25 fms.; Punta Banda, Lower Calif. littoral (Burch); Tide pools at White's Point, San Pedro; Isthmus Cove, Catalina (Strong); White's Point, San Pedro; Mission Bay, San Diego Co. (A.G. Smith);

Genus Turbonilla Risso,1826. Dr. A. Myra Keen advises on the type of this genus as follows: " The genotype of Turbonilla is T. plicatula Risso,1826 (by sub. des. Dall and Bartsch in Arnold,1903), (not Turbo plicatulus Brocchi,1814, a Turbonilla) = T. typica Dall and Bartsch in Arnold, 1903".

" Shell with a sinistral apex, cylindro-conic, many whorled, generally slender; with a single columellar fold which varies in strength and frequently is not visible in the aperture. The sculpture both axial and spiral ranges from obsolete to strongly incised lines or raised lamellae" (Dall and Bartsch,1909, p. 28).

Subgenus Turbonilla Risso s.s. Type: Turbonilla typica Dall and B Bartsch = T. plicatula Risso,1826, not Turbo plicatulus Brocchi,1814.

" Turbonillas without spiral sculpture, having prominent vertical ribs which extend from the summits of the whorls to the umbilical region; the same is true of the intercostal spaces. Usually both ribs and intercostal spaces are less strongly defined on the base below the periphery, than on the exposed portion of the whorls above it. Columella straight or slightly twisted. All our west coast forms belonging to this subgenus are small and slender, of semitranslucent bluish-white to milk white color." (Dall and Bartsch,1909, p. 29).

Turbonilla acra Dall and Bartsch,1909. Catalina Island, Calif. to Los Coronados Islands (Baker). Type locality: Catalina Island.

Collecting data: Catalina (30 to 50 fms.(Gordon); Coronados(Baker).

Turbonilla diegensis Dall and Bartsch,1909. San Pedro to San Diego.
Type locality: San Diego.

Collecting data: Mission Bay (A.G. Smith); San Pedro : San Diego, a variety on the mud flats (T.S. Oldroyd); San Diego (Orcutt);La Jolla (Chaney); San Diego12/30 Hemphill and Baker (San Diego Museum).

Turbonilla gilli Dall and Bartsch,1907. Catalina Island to San Diego.
Type locality: San Diego. Pt. Vincent to Los Coronados (Baker).

Collecting data: Off Catalina in 30-40 fathoms (Strong); South Island, Los Coronados in 18 fathoms (Baker); 12 fathoms off Point Vincent, Los Angeles Co. (Dr. W.O. Gregg).

Turbonilla gilli delmontensis Dall and Bartsch,1907. Monterey Bay,Calif.

Collecting data: Monterey Bay in 5 to 25 fms. rare (A.G. Smith).

Subgenus *Chemnitzia* D'Orbigny,1839. Type (by monotypy), *Melania campanellae Philippi* (Advice of Dr. A.M. Keen).

" Turbonillas without spiral sculpture, having prominent axial ribs which fuse or terminate at the periphery. The intercostal spaces are deep and sunken and terminate at or a little above the periphery, extending upward to the summits of the whorls. Base smooth, devoid of all sculpture. Columella straight. All our West American species belonging to this group are small, slender forms of semitranslucent bluish-white to milk white color." (Dall and Bartsch, 1909, p. 33).

This is as good a place as any for a general discussion of the subgenera of *Turbonilla*. Mr. George Willett in Trans. San Diego Soc. Nat. Hist. vol. 8,no.30, pp. 379-406, pls. 25,36 was of the opinion that *Chemnitzia* and *Strioturbonilla* should be lumped with *Turbonilla s.s.* While it seems to me that Mr. Willett made an excellent case for this practice the fact remains that there are many other students who so far from ' lumping' these groups are disposed to elevate them to generic rank. I wish some of them would explain in simple words just how they propose to conveniently separate them though in actual practice. However, Mr. A.M. Strong, our recognized authority on this family continues to use the three subgenera. Mr. A.G. Smith comments as follows: " My thought would be to leave the subgeneric names of the Pyramidellidae stand as Dall has them in Bull. 112. In our Monterey paper we follow Willett, as we believed he had a real point in grouping some of the genera in *Turbonilla*. Certainly it is difficult to separate *Turbonilla*,*Chemnitzia*, and *Strioturbonilla* as you indicate. However, as you are not monographing the family, I would let the situation stand as it is. Some day not too far off, someone is going to raise all subgenera to genera. Personally I am opposed to this as being unnecessary, although those who would split up the genus *Odostomia* have something to be said for their point of view. It would save some time in writing of subgeneric names which is now essential in a genus with so many species. Dr. Keen comments " I'll admit I have difficulties with these subdivisions."

However, we will follow the old classifications in this paper leaving it to some specialist and may he start work soon to adjust these matters.

Mr. A.M. Strong comments with an interesting note on a point " There are quite a number of species which it seems like we should have which have not shown up. In hunting for them I think that we have been inclined to pay too much attention to individual differences. I usually find that when one of these missing species does show up that the differences are much greater than an examination of the figure and description would lead one to expect at first glance.

Dr. Joshua L. Baily Jr. comments " I believe Chemnitzia is not identical with Turbonilla though it might profitably be consolidated with it. I would make it a subgenus or section if Dr. Strong approves."

Dr. A. Myra Keen brings up a point of interest involving the date of publication of many of these species: " I note also that Iredale discusses the date of publication of the Mazatlan Catalogue and proves pretty conclusively that it was published as a whole in 1857. The title page says 1855-1857, and there are a series of dates running through the work at the foot of certain pages. This would imply publication in parts, and I have always naively taken these dates as the dates of publication. Iredale, however, cites a note by Carpenter that shows that these dates refer to the pulling of proof sheets which were circulated among Carpenter's colleagues. The book as a whole was not issued by the British Museum until after June 1857. I am afraid this is going to mean some nomenclatorial changes. For example, Mytilus adamsianus Dunker vs. M. multiformis (see the Minutes no. 36, p.10). If these are synonymous , then adamsianus will have slight priority. Doubtless you will find other examples as you index the Minutes."

Turbonilla aepynota Dall and Bartsch,1909. San Pedro, Calif. to San Martin Island, Mexico. Type locality: off San Martin Island in 30 fms.
Collecting data: Tide pools, Point Vincente (Strong); La Jolla (Chaney); South Island, Los Coronados 3-6 fms. (Dr. F. Baker); Catalina Island in 30-70 fms. (Hanna); San Diego (Gripp); off Avalon, Catalina Island in 35 fms. (Burch).

Turbonilla clarinda Bartsch,1912. San Diego to Redondo Beach,75 f (Burch)
Collecting data: San Diego 12-30 fms. (Hemphill); San Diego (Gordon); off Redondo Beach in 75 fms. mud bottom (Det. by A.M. Strong). (Burch).

Turbonilla engbergi Bartsch,1920. Puget Sound
Type locality: San Juan Island, Gulf of Georgia.
Collecting data: Strait of Juan de Fuca (Eyerdam); Olga, Orcas Id. Puget Sound (Turn Island, Puget Sound (T.S. Oldroyd); Washington(Lowe).

Turbonilla gabbiana Cooper,1870. Monterey, Calif.
Collecting data: " Apparently known only from the type collected at Monterey, which is not in the Univ. of Calif. collection and is presumed to be lost. There is a possibility that T. cayucosensis Willett , which is occasionally found in beach drift at Monterey and Pacific Grove may be gabbiana although Gabb's description calls for 23 axial ribs, while cayucosensis normally has 20-22. (Syn. Chemnitzia gracillima Gabb)."(A.G. Smith)

/ Santa Monica
Turbonilla hypolispa Dall and Bartsch,1909. San Pedro and Catalina Island south to San Martin Island, Mexico. Type locality: off San Diego.
Collecting data: off Long Beach in 12 fms. (Strong); San Diego Bay in 12 and 30 fms. (Hemphill and Baker); San Martin Island (Baker); San Pedro; Catalina Island in 35 fms. (Lowe); off Santa Monica, Calif. in 15 fms. and off Malaga Cove in 15 fms. (Burch.

Turbonilla kelseyi Dall and Bartsch,1909. Santa Barbara, Calif. to San Ignacio, Mexico. Type locality: San Diego

Collecting data: Off Long Beach in 12 fms. (Strong); San Diego (T.S. Oldroyd); Mission Bay; Reef Point, Orange Co. (A.G. Smith); San Diego Bay off National City (Chace); San Diego Bay in 12 and 30 fms. (Hemphill and Baker); End of Point Loma (Baker); Laguna Beach (Lowe); between Pt. Firmin and White's Point (Dr. W.O. Gregg).

Turbonilla muricatoides Dall and Bartsch,1907. Monterey to San Pedro Type locality: Monterey

Collecting data: Monterey Bay in 15 to 25 fms. (Calif. Acad. Sci.); White's Point, San Pedro (A.G. Smith); off Monterey in 15 fms. (Burch)

Turbonilla raymondi Dall and Bartsch,1909. / Redondo Beach in 50-75 f. (Burch) Santa Rosa Island to San Diego. Type locality: Off Catalina Island. to Pt. Abreojos, L.C. (Burch) (Strong)

Collecting data: Off Catalina Island in 30-40 fms. (Strong); White's Point, San Pedro (T.S. Oldroyd); off Coronado in 50 fms. (Gordon); San Diego in 10 and 30 fms. (Hemphill and Baker); Catalina Island in 35 fms. (Lowe); off Point Vincente in 12 fms. (Dr. W.O. Gregg); off Redondo (Burch). Set in Burch Coll. fr Pt. Abreojos ex M. Gordon Det. by A.M. Strong.

Turbonilla santarosana Dall and Bartsch,1909. Monterey Bay (C.A.S.) to South Coronado Island (Baker). Type locality: off Santa Rosa Id. in 53 fms.

Collecting data: Monterey Bay in 25 fms. (C.A.S.) (A.G. Smith); Newport Bay- sand bar near entrance- bar since dredged out (W.O. Gregg); Ocean Beach (Baker); South Coronado Island in 7 -14 fms. (Baker);

Subgenus Strioturbonilla Sacco,1892. Type (fide Dall and Bartsch,1909) Strioturbonilla alpina Sacco.

" Shell as in Turbonilla and Chemnitzia but finely and closely spirally striated on the spire and base. All our West American species, with the exception of T. affinis and T. smithsoni, are of bluish white to milk-white color; the two exceptions being of a yellowish cast." (Dall and Bartsch, 1909, p. 40).

Turbonilla aresta Dall and Bartsch,1909. Santa Rosa Island to San Diego Type locality: Catalina Island.

Collecting data : off Catalina Island in 30-40 fms. (Strong); White's Point, San Pedro (Det. by Bartsch, USNM) (A.G. Smith); San Diego (T.S. Oldroyd); San Diego Bay (Hemphill and Baker); San Pedro and Catalina Island in 35 fms. (Lowe); off Redondo Beach in 25 fms. and off Catalina Island in 35 fms. (Burch).

Turbonilla asser Dall and Bartsch,1909. Monterey Bay to San Diego Type locality: off Redondo Beach, Calif.

Collecting data: Midspit, San Diego Bay (Hemphill and Baker); Newport Bay (Strong); Monterey Bay in 15-25 fms. (Smith and Gordon); San Diego (Gordon); San Pedro (Chace); off Avalon, Catalina Island in 35 fms.; off Malaga Cove in 15 fms.; off Santa Monica in 15 fms.; off Redondo Beach in 25-75 fms. (Burch).

Turbonilla attrita Dall and Bartsch,1909. San Pedro to Todos Santos Bay (Burch). Type locality: San Pedro.

Collecting data:

(con.)

Collecting data: Newport Bay (Strong); off Coronado Hotel in 35 fms.(Hemphill); San Diego Bay; Point Loma in 5-8 fms. (Baker); San Pedro a nd Newport Bay (Lowe); San Pedro (T.S. Oldroyd); San Diego (Oldroyd); Coronado in 25 fms. (Gordon); Todos Santos Bay in 5 -10 fms. (Burchand Gordon); off Malaga Cove in 10 fms.; from pilings off Redondo Beach (Burch).

/ Redondo Beach to Todos Santos Bay (Burch).
Turbonilla bakeri Bartsch, 1912. San Diego Bay, Calif.

Coll. Data: Off Redondo Beach 25f, Malaga Cve., 10f., off Ensenada in 15f San Pedro 15f; Crystal Pier, San Diego in pilings (Burch) (Det. by A.M. Strong

Turbonilla barkleyensis Bartsch, 1917. Barkley Sound, Vancouver Island, B.C.

Collecting data: Queen Charlotte Islands (Gordon); (Oldroyd).

Turbonilla buttoni Dall and Bartsch, 1909. Santa Rosa Island, Calif. to Pt. Abreojos, L.C. Type locality: San Pedro, Calif.

Collecting data: Many shore localities (Strong); San Pedro; San Diego; Pt. Abreojos; San Hipolito Pt.; La Paz, L.C. (T.S. Oldroyd); White's Point, San Pedro- common (A.G. Smith); So. Coronado Island; San Martin Island (Baker); Espiritu Santo Island (Capt. Porter); San Geronimo Island (Lowe); Pt. Abreojos (Hemphill); San Diego Bay (Hemphill); Ocean Beach (Baker); Pt. Loma (Baker); Laguna Beach (Lowe) (San Diego Museum); Pt. Firmin, San Pedro (W.O. Gregg); Pt. Firmin and San Diego (Chace); Mission Bay; Santa Monica; Malaga Cove in 10 fms.; Bird Rock, San Diego Co.; off Redondo Beach in 25 fms. (Burch).

Turbonilla canadensis Bartsch, 1917. Forrester Island, Alaska.

/ Redondo Beach, 10 fms.(Burch).
Turbonilla carpenteri Dall a nd Bartsch, 1909. San Pedro to Coronado Islands, Type locality: San Pedro.

Collecting data: off Coronado Islands in 50 fms. (T.S. Oldroyd); La Jolla (Bristol); La Jolla (Chaney); off Redondo Beach and Malaga Cove in 10-25 fms. (Det. by A.M. Strong) (Burch).

Turbonilla cayucosensis Willett 1929. Monterey to Cayucos. Type locality: Cayucos.

Collecting data: Pacific Grove in drift (Det. by Geo. Willett) (A.G. Smith); Cayucos (Paratypes) (San Diego Museum). Off Monterey, 20f (Burch)

Turbonilla dinora Bartsch, 1912. San Diego, Calif.

Collecting data: San Diego (Gripp).

Turbonilla dracona Bartsch, 1912. Off Redondo Beach in 25 fms.(Burch) to San Diego
Type locality: San Diego.

Collecting data: Reef Point, Orange Co. (Det. by U.S.N.M.) (A.G. Smith); off Redondo Beach in 25 fms., gravel bottom. (Det. by A.M. Strong)

Turbonilla encella Bartsch, 1912. San Pedro, Calif.

Turbonilla galianoi Dall and Bartsch, 1909. San Diego, Calif. to Cape San Lucas. Type locality: Cape San Lucas. San Pedro, San Diego, San Hipolito (T.S. Oldroyd).

Turbonilla humerosa Dall and Bartsch, 1909. Catalina Island to San Diego
Type locality: off Catalina Island.

Turbonilla kincaidi Bartsch,1921. Proc. Biol. Soc. Wash. 34:33,34 Dogfish Bay, Puget Sound.

Collecting data: Dredged in Puget Sound near San Juan Islands,1940 (T. Kincaid); Paratypes in San Diego Museum, Gordon Collection and also A.G. Smith coll; Olga, Wash. (Engberg) (W.O. Gregg).

/ off Redondo Beach in 25 fms s

Turbonilla profundicola Dall and Bartsch,1909. Off Catalina Island to San Diego, Calif. in 197 fms. Type locality : off La Jolla, Calif. off Redondo Beach in 25 fms. (Burch)

Turbonilla serrae Dall and Bartsch,1907. Monterey Bay to Coronado Islands (Baker). Type locality: Monterey.

Collecting data: Monterey Bay in 5 to 40 fms. (Smith and Gordon); Coronados Islands (Baker); San Diego in 15 fms. (Baker) (San Diego Mus. .) Monterey in 10-20 fms. (Strong). Redondo Beach, 25 fms. (Burch).

Turbonilla stylina Carpenter,1865. Sitkalidak I., Kodiak Is. (Eyerdam) south to Coronado Islands. Type locality: Santa Barbara. The above is an extention of range northward several thousand miles from Monterey, Calif.

Mr. A.M. Strong comments on this as follows: " Carpenter gives the locality as Monterey and Santa Barbara. Dall and Bartsch give Monterey as the type locality but list " two specimens both immature , dredged in 50 fms. off the Coronados Islands" and the range is usually given as from Monterey to the Coronados Islands. I have seen no specimens from southern California which are the same as Monterey specimens which I have. I doubt the range."

Collecting data: Monterey (Strong); Departure Bay, B.C. and Coronado Islands (T.S. Oldroyd); Monterey Bay in 10-40 fms. (Smith and Gordon); Carmel Bay in 25 fms. (C.A.S.) (A.G. Smith); off Pt. St. Vincente (Gregg); Coronado Islands in 50 fms. (Oldroyd); San Pedro (Lowe) (San Diego Mus.);

Turbonilla torquata Gould,1853. Monterey to San Diego to Todos Santos Bay Type locality ? Santa Barbara, Calif.

Mr. A.M. Strong comments on this as follows : " Dall and Bartsch describe a species which they credit to Gould. They list several localities all from deep water. All your specimens come from 25 to 75 fathoms. It is hard to see how Gould could have had a specimen of this, presumably collected on shore at Santa Barbara."

Collecting data: Monterey Bay in 10-30 fms, (Smith and Gordon); San Diego (Hemphill) (Orcutt) (T.S. Oldroyd); Todos Santos Bay ; off Redondo in 25-75 fms.; off Avalon, Catalina Island in 35 fms. (Burch). off Santa Cruz Id. in 50 fms. (Burch).

Turbonilla vancouverensis Baird,1863. Port Etches, Alaska to Monterey (Berry). Type locality: Esquimalt Harbor, Vancouver Island " Taken from the crop of a Pin-tail duck."

Collecting data: Strait of Fuca (Eyerdam); Departure Bay, B.C. in 25 fms.; Nanoso Bay, B.C. in 20 fms. (T.S. Oldroyd); Uyak, Kodiak Island, Alaska (Hanna);

Turbonilla simpsoni Dall and Bartsch,1909. Off Redondo to San Diego Type locality: San Pedro, Calif.

Collecting data: off Catalina in 30-40 fms. (Strong); off Catalina in 35 fms. and also San Pedro (Lowe); San Pedro (T.S. Oldroyd); Off Redondo Beach in 25-75 fms. (Burch) (Det. by A.M. Strong).

Subgenus Pyrgolampros Sacco,1892. Type: (by orig. des.): Pyrgolampros mioperplicatulus Sacco.

" Turbonillas with low, broad, rounded vertical ribs which almost always dissapear as they pass over the periphery and base of the last whorl, and many very fine, faint,wavy spiral striations; surface covered by a thin epidermis. Columella usually somewhat flexuouse.

All our west American species are of a light- yellow to chocolate brown color. The intercostal spaces are not depressed as in Chemnitzia, but ~~dissapear~~ appear as simple shallow undulations between the axial ribs. The spiral striations, in perfect specimens, appear as if they were situated beneath a light-colored epidermis and were shining through it." (Dall and Bartsch, 1909, p.p. 59-60.)

Turbonilla alaskana Dall and Bartsch,1909. Kodiak, Alaska to Puget Sound (Baker). Type locality: St. Paul, Kodiak, Alaska.

Collecting data: Wide Bay, Alaska in 13 fms. (Hanna, C.A.S.); Orcas Island, Puget Sound in 10-30 fms. (Dr. Fred Baker); Shuyak Strait; Raspberry Island (Eyerdam)

Turbonilla aurantia Carpenter,1864. Departure Bay, B.C. and Puget Sound
Type locality: ? Puget Sound Victoria, B.C. (Eyerdam).

Turbonilla berryi Dall and Bartsch,1907. Monterey to Catalina Island.
Type locality: Monterey.

Mr. A.G. Smith comments on this species as follows: " We believe this and chocolata are conspecific. Records for berryi should appear under chocolata." However, since there seems to be a difference of opinion on this matter we will carry both names for the time being.

Collecting data: Monterey Bay in 8-29 fms. (Smith and Gordon); Carmel Bay in 20 fms. (A.G. Smith); Mont rey (Strong); dredged off Monterey, Del Monte in 20 fms. (Burch.

/ Redondo Beach 25 fms. (Burch)
Turbonilla chocolata Carpenter,1864. San Pedro to San Diego.
Type locality: San Diego.

Mr. A.G. Smith is of the opinion that both T. berryi D & B and also T. painei D & B. should be placed in the synonymy of this species.

Collecting data: San Pedro (Willett); Coronado Beach 15 fms. (Gordon); off Newport Bay in 10 fms. (Strong).

Turbonilla eyerdami Bartsch,1927. Proc. U.S.N.M. vol.70,pp 8,9, pl.2,f.12
Shuyak Strait, Afognak Island, Alaska. Collected by Eyerdam in 1924.

Turbonilla franciscana Bartsch,1917. San Francisco Bay, Calif.
S.F. Bay (Albatross- C.A.S.).

Turbonilla gloriosa Bartsch,1912. Off San Diego, Calif. in 12 fms.

Turbonilla gouldii Dall and Bartsch,1909. Santa Rosa Island to San Diego
Type locality: San Pedro

Collecting data: off Long Beach in 12 fms. (Strong); San Pedro (Lowe); San Pedro- 2 sp. (T.S. Oldroyd); off Pt. Vincente in 12 fms. (W.O. Gregg); Malaga Cove in 15 fms.; (Burch); S. Coronado Island (Dr. Baker)

Turbonilla halia Dall and Bartsch,1909. Monterey (Smith and Gordon) to Todos Santos Bay (Gordon and Burch). Type locality: San Diego.

Mr. A.M. Strong in rechecking the Burch collection made the following note " If the identifications made for me in Washington are correct you do not have P. lowei or P. chocolata. I am inclined to put all your specimens in P. halia as a variable species." We are very much surprised at this but are accepting Mr. Strong's diagnosis.

Collecting data: San Pedro in 8 fms. (Lowe); Monterey Bay in 12-25 fms. and Coronado in 25 fms. (Gordon); Todos Santos Bay 5-10 fms. (Gordon and Burch); off La Jolla in 35 fms. (W.O. Gregg); Redondo Beach 25 fms. (Burch) Santa Monica in 15 f; Monterey in 25f; off Ensenada in 15-25 f; off the large spider crab Loxorhynchus crispatus off Santa Monica (Burch).

Turbonilla halibrecha Dall and Bartsch,1909. Monterey Bay (Smith) to Catalina Island. Type locality: Catalina Island.

Collecting data: 10 fms. off Del Monte, Monterey Bay, Det. by P. Bartsch at the U.S.N.M. (A.G. Smith); off Redondo Beach in 75 fms. (Burch).

Turbonilla halistrepta Dall and Bartsch,1909. Monterey to San Diego Type locality: off Newport.

Collecting data: off Del Monte in 10 fms., 2 specimens which seem to belong to this species (A.G. Smith); Coronado in 25 fms. (Gordon);

Turbonilla ilfa Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 7, pl.1, fig.1. San Pedro, Calif.

Collecting data: " I collected the original on Terminal Island, but evidently only found one. Bartsch says it is the largest of the Pyrgolampros." (A.G. Smith).

Turbonilla keepi Dall and Bartsch,1909. Long Beach to San Diego, Calif. Type locality: Long Beach, Calif.

Turbonilla lowei Dall and Bartsch,1903./ Monterey / to Todos Santos Bay, L.C . Type locality: off San Pedro, Calif.

Collecting data: San Pedro in 10 fms. (Lowe); off Coronado Hotel in 12 fms.; Ballast Pt., San Diego in 10 fms. (Dr. F. Baker); off Malaga Cove in 10 fms. (Willett); Monterey 10-40 f (Smith); Todos Santos Bay (Burch) Monterey specimens det. by Bartsch.

Turbonilla lituyana Dall and Bartsch,1909. Lituya Bay, Alaska.
Konatak Lagoon, Portage Bay, Alaska in 6 fms. (Hanna).

Turbonilla lyalli Dall and Bartsch,1907. Banks Island, B.C.
Banks Island (T.S. Oldroyd).

Turbonilla macouni Dall and Bartsch,1910. Barkley Sound, Vancouver Island .

Collecting data: Departure Bay, B.C. (T.S. Oldroyd).

Turbonilla middendorffi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 8,9, pl.2 fig. 2. Type locality: Shuyak Strait, Afognak Island, Alaska.

Collecting data: W.J. Eyerdam has paratypes from Shuyak. : Wide Bay, Alaska (Hanna, V.A.S.) .

Turbonilla newcombei Dall and Bartsch,1907. Port Simpson to Victoria, B.C Type locality: Port Simpson, B.C..
Collecting data: Departure Bay, B.C. (T. Oldroyd);

Turbonilla oregonensis Dalland Bartsch,1907. Off the coast of Washington and Oregon in 30 fathoms south to Crescent City, Calif. in 19 fms.(Gordon).
Collecting data: Crescent City in 19 fms. (Gordon.)

Turbonilla painei Dalland Bartsch,1909. Redondo Beach to San Diego
Type locality: off Redondo Beach, Calif.
Collecting data: Dredged off Redondo Beach in 25 fms. (Burch); off Newport Bay in 10 fms. (Strong). off Pt. Vicente in 20 fms. (Burch.
/ Victoria, B.C.

Turbonilla pedroana Dalland Bartsch,1903. Monterey to San Diego
Type locality: San Pedro. / to Todos Santos Bay (Burch.
Collecting data: off Newport in 10 fms. (Strong); San Pedro in 10 fms. (Lowe); Monterey (Lowe); off Long Beach in 8 fms. (W.O. Gregg); Monterey Bay in 10-20 fms. (Smith and Gordon); San Diego (T.S. Oldroyd); Punta Banda, L.C.; off Santa Monica in 5 fms. (Burch).

Turbonilla pugetensis Bartsch,1917. Puget Sound.

Turbonilla pesa Dall and Bartsch,1910 Barkley Sound, Vancouver Island, B.C.

Turbonilla ridgwayi Dall and Bartsch,1909. San Diego, Calif. to San Pedro
Collecting data: San Diego (T.S. Oldroyd); Bird Rock, San Diego (Baker) Point Firmin, San Pedro (Strong).

Turbonilla rinella Dall and Bartsch,1910. Barkley Sound, Vancouver Island
Collecting data: Nanaimo, B.C. (T.S, Oldroyd);

Turbonilla shuyakensis Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 7,8, pl.2 Fig. 1. Shuyak Strait, Afognak Island, Alaska.
Collected by W.J. Eyerdam in 1924. ; Kanatak Lagoon, Portage Bay, Alaska (Hanna, C.A.S.).

Turbonilla skogsbergi Strong,1937. See p. 17 for description.
Nautilus 51-54, pl.4, fig.3. Type locality: Monterey Bay in 28 fms.
Range: Monterey to Redondo Beach, Calif.
Collecting data: Monterey Bay in 28 fms.;(Gordon); off Capitola in 5 fms. (W. Williams); Redondo Beach in 25 fms. (Burch); Drakes Bay in 30-35 fms. are close to this (A.G. Smith); off Monterey in 20 fms. (Burch).

Turbonilla stelleri Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 6,7, pl.2, f.4
Shuyak Strait, Afognak Island, Alaska. Collected by W.J. Eyerdam in 1924.

Turbonilla strongi Willett,1931. See P. 16 for description.
Nautilus 45-67, pl.14, fig.4. Type locality: " in 25 fms. off the north shore of Catalina Island."

Turbonilla talma Dall and Bartsch,1910. Barkley Sound, Vancouver Island.

Turbonilla taylori Dalland Bartsch,1907. Port Simpson to Vancouver Island
Type locality: Departure Bay, B.C. / to Puget Sound
Collecting data: Victoria, B.C. (Eyerdam); Departure Bay and Puget Sound (T.S. Oldroyd);

Turbonilla valdezi Dall and Bartsch,1907. Barkley Sound, Vancouver Island to Monterey. Type locality: Monterey. / to Cayucos (Burch).

Collecting data: Pacific Grove, 2 specimens not quite typical (A.G. Smith); Cayucos (Burch); San Pedro, Calif. specimens not typical but close (T.S. Oldroyd); off Monterey in 20 fms. shale; littoral at Cayucos; (Burch) (Det. by A.M. Strong).

Turbonilla victoriana Dall and Bartsch,1907. Vancouver Island, B.C. to Puget S.

Collecting data: Departure Bay (T.S. Oldroyd); Olga Island, Puget Snd. (Baker);

Turbonilla tremperi Bartsch,1917. off San Diego Bay in 15 fms.

Collecting data: San Diego (Baker).

Subgenus Pyrgiscus Philippi,1841 Type (by sub. desig. Dall and Bartsch 1904), Melania rufa Philippi.

" Turbonillas having prominent axial ribs and deeply incised spiral lines, but no varices or internal lirations on the outer lip. Columella somewhat flexuous." (Dall and Bartsch,1909, p. 74).

Turbonilla adusta Dall and Bartsch,1909. San Diego, Calif. to Redondo(Burch).

Collecting records: San Diego Bay in 1½ fms. (Baker); off Redondo 25 fms. (Burch).

Turbonilla almo Dall and Bartsch,1909. Monterey (Smith & Gordon) to Todos Santos Bay (Burch and Gordon). Type locality: San Diego.

Collecting data: Mont rey Bay in 5-40 fms. (S,ith & Gordon); off Redondo Beach in 25 fms. (Burch & Gordon); Todos Santos Bay (Burch & Gordon); San Diego (T.S. Oldroyd); Arbolitos, L.C. littoral (Burch).

Turbonilla antemunda Dall and Bartsch,1909. Monterey Bay (Smith & Gordon) to San Diego (Gordon). Type locality: off Santa Rosa Island, Calif.

Collecting data: Monterey Bay in 5-15 fms.;(Smith & Gordon); off Coronado in 25 fms. (Gordon); Point Vicente (Burch).

Turbonilla antestriata Dall and Bartsch,1907. Esteros Bay to San Diego, Calif. Type locality: Esteros Bay, Calif.

Collecting data: Monterey Bay in 40 fms. (Burch); off Redondo Beach in 25 fms. (Burch); San Diego (Gripp); So. Coronado Island (Dr. Fred Baker); Ballast Point in 8 fms. (Baker); San Pedro (Lowe); off Long Beach in 12 fms. (Strong); off Catalina Island in 35 fms. (Burch); Malaga Cve. in 10 fms. (Burch).

Turbonilla aragoni Dall and Bartsch,1909. Monterey to Redondo Beach (Burch). Type locality: Monterey Bay in 20 fms.

Collecting data: Monterey Bay in 10 fms. (Det. by U.S.N.M. - Smith) (Burch); off Redondo Beach in 25 fms. (Burch); off Monterey , 10,25 & 40 fms. (Burch).

Turbonilla auricoma Dall and Bartsch,1903. San Pedro to Scammon's Lagoon, L.C. / off Santa Monica in 15 fms.(Burch) Type locality: Scammon's Lagoon.

Collecting data: Scammon's Lagoon; San Diego (Dr. Baker); San Pedro (Lowe); off Santa Monica in 15 fms.; San Onofre, Calif. littoral(Burch). (Det. by A.M. Strong).

Turbonilla burchi Gordon,1938. See p. 17 for description.
Nautilus 52: 49,50, pl.4, figs. 3-5.

Type locality: off Redondo Beach in 25 fms. Also dredged off Rocky Pt. in 40 fms. (Burch).

Turbonilla callia Dall and Bartsch,1909. San Diego, Calif.

Turbonilla callimene Bartsch,1912. San Diego, Calif.

Turbonilla canfieldi Dall and Bartsch,1907. Monterey Bay to Todos Santos Bay (Burch). Type locality: Monterey.

Mr. A.M. Strong comments on this species as follows: " Your specimens from off Redondo seem to be identical with that described and figured from Monterey. If so this is the only species of Turbonilla which is found in both southern California and Monterey that I know of."

Collecting data: Monterey Bay in 10-40 fms. (Smith & Gordon); Redondo Beach in 25 fms. (Burch); Todos Santos Bay in 5-10 fms. (Burch); S. Coronado Island (Baker).

Turbonilla castanea Keep,1888. Monterey Bay (Smith) to San Hipolito, L.C. (T.S. Oldroyd). Dr. A.M. Keen advises regarding the type locality " The type locality was not given in the original. Syntype labels give it as San Diego."

Collecting data: Monterey Bay, 1 specimen (A.G. Smith); San Hipolito, L.C. (T.S. Oldroyd); San Diego Bay (Dr. Baker); San Diego (Hemphill); off Newport in 10 fms. (Strong). / S. Corondo Island (Baker)

Turbonilla castanella Dall,1908. Monterey to Redondo Beach (Burch). Type locality: Monterey.

Collecting data: Dr. A. Myra Keen advises " Oldroyd, vol. II, pl.2, p. 142 cites Pl.66, fig.7 for castanea; this is castanella." Monterey Bay in 10-40 fms. (Smith & Gordon); Redondo Beach in 25 fms. (Burch); South Coronado Island in 14 fms. (Dr. Fred Baker); Monterey (Strong)(Burch).

Turbonilla delmontana Bartsch,1937. Nautilus 50:100,101. New name for T. delmontensis Bartsch,1927 (Proc. U.S.N.M. vol. 70, pp. 9,10, pl.2, fig. 11). Type locality: off Del Monte in 10 fms.

Turbonilla dora Bartsch,1917. San Diego, Calif.

Turbonilla eva Bartsch,1917. San Diego, Calif.

Turbonilla eucosmobasis Dall and Bartsch,1907. San Luis Obispo to San Diego, Calif. Type locality: off Santa Barbara, Calif.

Collecting records: San Pedro (Lowe).

Turbonilla grippi Bartsch,1912. San Diego.

Collecting data: San Diego (T.S. Oldroyd).

Turbonilla ina Bartsch,1917. Long Beach (Strong) to San Diego
Type locality: San Diego

Collecting data: off Long Beach in 12 fms. (Strong).

Turbonilla ista Bartsch,1917. Pt. Vincent (Strong) to San Diego
Type locality: San Diego. off Point Vincent in 12 fms. (Strong).

/ Santa Monica (Burch)

Turbonilla jewetti Dall and Bartsch,1909. San Pedro, Calif. to San Hipolito Bay, L.C. Type locality: San Diego.

Collecting data: Newport Bay (Strong); Laguna Beach (Caruthers); La Jolla (Chaney) (Beckwith) Bristol); Reef Pt., Orange Co. (A.G. Smith); San Pedro (T.S. Oldroyd); San Pedro (Mrs. Bladridge) (A.G. Smith); Point Loma (A.G. Smith); off Santa Monica in 15 fms.; Punta Banda, L.C. and Dana Point, Orange Co. littoral (Burch); San Diego Bay (Baker).

Turbonilla morchi Dall and Bartsch,1907. Monterey (Smith) to San Diego. Type locality: Long Beach, Calif.

Collecting data: Monterey, det. by P. Bartsch at U.S.N.M. (A.G. Smith); off Redondo Beach in 25 fms. (Burch); San Diego (T.S. Oldroyd); Catalina Island in 50 fms. (Lowe); off Catalina in 30-40 fms. (Strong); off Santa Cruz Island in 50 fms.; off Catalina in 35 fms.; (Burch); S. Coronado Island in 14 fms. (Baker).

Turbonilla nereia Dall and Bartsch,1909. Redondo Beach to San Diego. Type locality: San Pedro

Collecting data: off Redondo Beach in 25 fms. (Burch)

Turbonilla nuttingi Dall and Bartsch,1909. Off San Pedro and San Diego in 15 to 20 fms. Type locality: San Diego.

Collecting data: San Pedro (T.S. Oldroyd); San Diego and San Pedro in 10 fms. (Lowe); Point Loma in 50 fms. (Dr. Baker); off Newport in 30 fms. (Strong);

/ off Redondo Beach 25 fms. (Burch)

Turbonilla obesa Dall and Bartsch,1909. Pacific Beach, San Diego Co., Calif. to Newport Bay (Strong). Type locality: Pacific Beach

Turbonilla pluto Dall and Bartsch,1909. San Pedro, Calif. to San Diego (Baker). Type locality: San Pedro.

Turbonilla recta Dall and Bartsch,1909. San Diego, Calif. to Point Abreojos, L.C. Type locality: Point Abreojos.

Collecting data: So. Coronado Island in 8 fms. (Dr. Baker);

Turbonilla signae Dall and Bartsch,1909. Redondo Beach (Burch) and San Pedro. Type locality: San Pedro.

Collecting data: off Redondo Beach in 25 fms. (Burch);

Turbonilla tenuicula Gould,1853. Monterey, Calif. to Point Abreojos, L.C. Type locality: ? Santa Barbara.

Collecting data: Many shore localities (Strong); San Diego (Hemphill); La Jolla (Bristol); Laguna Beach and San Pedro (Lowe); Scammon's Lagoon (Capt. Porter); White's Point (Chace); Pt. Firmin (Gregg); Monterey Bay, shore to 20 fms.(Smith & Gordon); San Pedro (T.S. Oldroyd); White's Pt/; Pt. Loma; Reef Pt., Orange Co.; North Island, San Diego; Corona del Mar; Laguna Beach; (A.G. Smith); " Gordon and I do not recognize any subspecies such as subcuspidata as being valid (A.G. Smith); Malaga Cove in 10 fms.; off Catalina in 25 fms.; off Redondo Beach in 25 fms.; (Burch).
Bird Rock; Dana Pt. and many littoral localities (Burch).

Turbonilla vexativa Dall and Bartsch,1909. San Pedro to San Diego. Type locality: San Pedro, Calif.

Collecting data: off Catalina in 12 fms. (W.O. Gregg);

Turbonilla virgo Carpenter,1864. Santa Barbara, Calif.

/ off Redondo Beach in 75 fms. (Burch)
Turbonilla weldi Dall and Bartsch,1909. Off Point Firmin, Calif.

Mr. George Willett in his Baldwin Hills paper in Trans. San Diego Soc. was of the opinion that the species arata (from off Catalina Island) and listed under the subgenus Bartschella is conspecific with this species. Mr. Allyn G. Smith comments on this" I think G.W. had a good point. You might follow him on it by combining it and T. (Bartschella) arata, but consider he was dealing with fossils and the Recent material might not bear out his opinion." No member of the club has reported the species.

Turbonilla wickhami Dall and Bartsch,1909. Catalina Island, Calif.

Subgenus Mormula A. Adams, 1864. Type (Sub. Desig. Verrill-Bush,1900), Mormula rissoina Adams.

" Turbonillas having axial ribs and deeply incised spiral lines; also irregularly disposed varices on the outer surface, which usually mark internal lirations on the outer lip, or internal lirations of the outer lip only" Sculpture never nodulose." (Dall and Bartsch,1909, p. 110.).

Turbonilla ambusta Dall and Bartsch,1909. Redondo Beach to San Diego.

Mr. Allyn G. Smith comments " Gordon and I believe this and tridentata are conspecific." There is disagreement on this though so we list it.

Collecting data: Ocean Beach and off South Corinado Island in 16 fms. (Dr. F. Baker); off Malaga Cove in 15 fms. and also from Newport Bay (Burch) (Det. by A.M. Strong).

Turbonilla catalinensis Dall and Bartsch,1909. Catalina Island, Redondo Beach (Burch) to San Diego (Baker). Type locality: Catalina Island.

Mr. A.M. Strong comments on the Burch specimens as follows: " This species is supposed to have external varices. Your sp cimens only occasionally show indications of varices but seem to agree in other ways. Most of them are young."

Collecting data: off Redondo Beach in 75 fms. (Burch); off Catalina Island in 30-40 fms. (Strong); Santa Barbara Chennel in 85 fms.(Crocker); (Gordon Coll.); Catalina Island in 35 fms. and San Pedro (Lowe); Ocean Beach (Baker);

Turbonilla clementina Bartsch,1927. Proc. U.S.N.M. vol. 70: 11, pl.2, f.9,10. Type locality: San Clemente Island.

No collecting records and only comment is from Allyn G. Smith " Bartsch says related to T. dora Bartsch, which is a Pyrgolampros ?"

Turbonilla enna Bartsch,1927. Proc. U.S.N.M. vol. 70: 10,11 pl.2, fig.8 Type locality: off Deadman's Island, San Pedro, Calif. in 6 fms.

/sch
Turbonilla escholtzi Dall and Bartsch,1907. (eschscholtzi) Izhut Bay, Afognak Island,1922 and Drier Bay, Knight Island,1923 (Eyerdam) south to Vancouver Island, B.C. Type locality: Carter Bay, B.C. to San Diego?

Collecting data: Eyerdam's record listed above is an extension of range northward rom Port Simpson; there is a record with a ? in the San Diego Museum from Ballast Pt.,San Diego in 8-10 fms. by Dr. F. Baker; Departure Bay B.C. (T. Oldroyd); Ocean Beach (Baker)?

Turbonilla heterolopha Dall and Bartsch,1909. San Diego, Calif. to San Hipolito Point, L.C. Type locality: San Diego, Calif.
Collecting data: San Diego (Kelsey);

Turbonilla lordi E.A. Smith,1880. Sitka, Alaska to Puget Sound. Type locality: Vancouver Island, B.C.
Collecting data: Craig Island, Alaska in 20-40 fms. (G. Willett); off San Juan Islands, Puget Sound (T. Kincaid); Alaska (Lowe);

Turbonilla pentalopha Dall and Bartsch,1903. Off Santa Monica, Calif. (Burch) to Todos Santos Bay, L.C. Type locality: San Diego.
Collecting data: Off Santa Monica in 15 fms.; off Redondo Beach in 25 fms. (Burch); off South Coronado Island in 10 fms. (Baker); San Pedro (T.S. Oldroyd); Isthmus Cove, Catalina Island (Strong);

Turbonilla periscelida Dall and Bartsch,1909. Santa Rosa Island, Calif.

Turbonilla regina Dall and Bartsch,1909. Santa Rosa Island to Catalina Island. Type locality: Santa Rosa Island. Off Redondo Beach in 75-100 fms. (Burch) (Det. by A.M. Strong).

Redondo Beach, 75 fms. (Burch)

Turbonilla santarosana Dall and Bartsch,1909./ Santa Rosa Island to Todos Santos Bay, L.C. Type locality: off Santa Rosa Island, Calif. in 53 fms. (T.S. Oldroyd)

Turbonilla tridentata Carpenter,1864. Monterey to San Diego.to La Paz,L.C. Type locality: Monterey, Calif. (by holotype label in U.S.N.M. (Keen)
Collecting data; Dredged off Santa Monica in 15 fms.; off Malaga Cove and Redondo Beach in 15-25 fms.; off Catalina Island in 35 fms.; Mission Bay in eel grass; off Monterey in 20 fms. on shale bottom (Burch); Newport Bay (Strong);) Chace) (Gregg); Monterey in 10-40 fms.; Carmel Bay in 20 f (A.G. Smith); San Pedro littoral; La Paz, L.C.; (T.S. Oldroyd); San Diego (Hemphill); Ocean Beach (Bristol); Newport Bay (Baker) (Lowe); Mission Bay and San Pedro (Lowe);

Subgenus Bartschella Iredale,1916. Proc. Malac. Soc. London, vol. 12, pt. 1, p. 36. Type (by orig. desig.); Dunkeria subangulata Carpenter.

Dr. A. Myra Keen advises on this as follows: " For Bartschella you may use the description Dall and Bartsch give for Dunkeria (1909, p. 120). As Iredale points out, their reinterpretation of type species is inadmissible under the rules, so Iredale proposed the genus Bartschells for Dunkeria subangulata. The name Dunkeria then applies to the group Dall and Bartsch called Pyrgisculus, and the latter goes into synonymy. This change was made in Bull. 112, though without comment. Although the genotype of Dunkeria by designation of Dall and Bartsch,1904 (D. paucilirata Carpenter) is not identical with the genotype of Pyrgisculus, it is congeneric, so that you may use Dall and Bartsch's description of the latter for Dunkeria."

" Turbonillas having the whorls stronger, rounded, and usually shouldered , marked by strong axial ribs and strong spiral cords, the junctions of which are frequently subnodulous." (Dall & Bartsch,1909, p.120- for Dunkeria)

3 mi. N. of Cayucos (A.G. Smith)

Turbonilla laminata Carpenter,1864./ Redondo Beach (Burch) to South Coronado Islands (Baker), San Diego. Type locality: Santa Barbara & San Diego
Collecting data: off Redondo Beach in 25 fms.; (Burch); S. Coronado Id. in 10 fms. (Baker); San Diego(Hemphill) (San Diego Bay (Baker); Ballast Pt.(Kelsey); Ocacan Beach; San Martin Id., L.C. (Baker); San Pedro (Lowe); Whites Pt.; Reef Pt.; Mission Bay (A.G. Smith); Pt. Firmin,San Pedro(Strong); San Pedro (Chace); Portuguese Bend (Gregg).

Turbonilla arata Dall and Bartsch,1909. Off Catalina Island, Calif.
As stated above Mr. George Willett was of the opinion that this species is conspecific with T. weldi placed under Pyrgiscus.
Collecting data: La Jolla (Bristol) (San Diego Museum);

Subgenus Dunkeria Carpenter,1857. Type (by Sub. Desig. Dall & Bartsch, 1904), Dunkeria paucilirata Carpenter.
" Turbonillas with a turrited spire having the whorls decidedly contracted at the suture, and tabulated at the summit, marked on the spire and base by many well incised lines." (Dall & Bartsch,1909, p.126- Pyrgisculus)

Turbonilla swani Dalland Bartsch,1909. San Pedro, Calif.

Genus Odostomia Fleming,1813. Dr. A. Myra Keen advised on this genus as follows: " The genus Odostomia dates from Fleming,1813. Edinburgh Encyclopedia, vol. 7, p. 67. Type (fido Winckworth,1932), Turbo plicatus Montagu."
" Shell with sinistral apex,. usually short, few whorled, subconic or ovate, with a single columellar fold which varies in strength and sometimes is not apparent at the aperture. The sculpture varies from smooth to lamellar axial ribs and spiral keels." (Dall & Bartsch, 1909, p. 131).

Subgenus Salasiella Dalland Bartsch,1909. Type (by Orig. Desig.), Odostomia laxa Dall and Bartsch.
" Shell pupiform, whorls inflated, marked by axial ribs which extend undiminished from the summit to the umbilical area. Varices strong, irregularly distributed." (Dall and Bartsch,1909, p. 133).

Odostomia laxa Dalland Bartsch,1909. Catalina Island (Gordon) to Scammons Lagoon, L.C. Type locality: Scammons Lagoon. Espiritu Santo Id.(Baker)
Collecting data: Off Catalina in 30-70 fms. (Gordon); Coronado Id.(Baker

Odostomia richi Dall and Bartsch,1909. San Pedro, Calif.

Subgenus Salassia De Folin,1885. Type (Sub. Desig. Dall & Bartsch), S. carinata De Folin = Salassia tropidata Dall and Bartsch

Odostomia oenoa Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 12, pl. 2, fig. 3 . Type locality: off Deadman's Island, San Pedro in 6 fms.
Collecting data: Isthmus Cove, Catalina Island (Strong).
Range: Catalina Island and San Pedro.

Subgenus Besla Dall and Bartsch,1904. Type (by Orig. Desig.), Chrysallida convexa Carpenter.
" Small Odostomias with axial ribs and three strong spiral raised threads, one at and two posterior to the periphery between the sutures; base marked by raised spiral threads." (Dall & Bartsch, 1909, p. 135).

Odostomia callimorpha Dalland Bartsch,1909. San Pedro, Calif. to Todos Santos Bay (Orcutt). Type locality: San Pedro.

Subgenus Chrysallida Carpenter, 1856. Type (Sub. Desig. Dall & Bartsch, 1909), Chrysallida communis Carpenter, not Chemnitzia communis C.B. Adams, 1852 = Odostomia (Chrysallis) torrita Dall & Bartsch, 1909.

" Odostomias having strong axial ribs crossed by equally strong spiral keels between the sutures, the intersection of these two elements forming nodules. The axial ribs pass only faintly over the base, while the spiral sculpture remains quite prominent." (Dalland Bartsch, 1909, p. 137).

As stated above there has been a disposition to raise the subgenera of both Odostomia and Turbonilla to generic standing. Of course, they may be right if many of these subgenera do not overlap. As a matter of fact it seems to me that there is little enough difference between some species of Odostomia and Turbonilla. Perhaps some species could actually be placed in ither with a fair argument to support it. The above remarks were made because several species of this group recently described were described by using Chrysallida with generic standing. Mr. Allyn G. Smith comments on this " If the taxonomic reason for splitting is merely to elevate a lot of new genera thus making room for more new subgenera, then there is no end to the possibilities. You gain nothing real."

Odostomia astricta Dalland Bartsch,1907. Moss Beach , San Mateo Co.,Calif. (Vokes) to San Diego (Gripp). to Lower Calif. (T.S. Oldroyd).
Type locality: Monterey, Calif.
Collecting data: Monterey Bay in 5-30 fms. (Smithand Gordon);

Odostomia catalinensis Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 17, pl. 3, fig. 4. Type locality: " on abalone at Catalina Island".
Collecting data: Catalina Island (Lowe and Baker); Isthmus Cove, Catal-ina Island (Paratypes) (Strong);

Odostomia chacei Bartsch,1927, Proc. U.S.N.M. vol. 70, pp. 16,17, pl.3, fig. 3. Cayucos, Calif. 3 mi.N.of Cayucos (A.G. Smith).

Odostomia cincta Carpenter,1864. Santa Barbara to San Diego
Type locality: Santa Barbara Islands.
Collecting data: San Diego (Hemphill); La Jolla (Chaney); San Pedro and San Diego (T.S. Oldroyd); Isthmus Cove, Catalina Island (Strong).

Odostomia clementensis Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 15,16, pl. 3, fig. 2. Type locality: San Clemente Island.
Range: Monterey Bay in 5-15 fms. south to San Clemente Island.
The Monterey record is a northern extension of range by A.G. Smith.

Odostomia clementina Dall and Bartsch,1909. Santa Cruz and Catalina Islands south to South Coronado Island. Type locality: San Clemente Island.
Collecting data: So. Coronado Island (Dr. Baker); Isthmus Cove, Catalina Island and Santa Cruz Island (A.M. Strong); Avalon, Catalina, littoral (A.G. Smith) (Det. by Bartsch at U.S.N.M.).

Odostomia cooperi Dalland Bartsch,1907. Monterey, Calif.
Collecting data: Monterey Bay, shore to 25 fms. (Smith and Gordon); Mr. A.G. Smith suggests that this species is very close to O. montereyensis and may be conspecific.

Odostomia cumshewaensis Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 13,14, pl. 3, fig. 10. Type locality: Cumshewa Inlet, British Columbia.

Odostomia dicella Bartsch,1912. San Diego
Coll. Data: La Jolla (Chaney);

Odostomia eugena Dall & Bartsch,1909. Redondo Beach (Burch) to San Hipolito Point, L.C. Type locality: San Hipolito Pt.
Coll. Data: Off Redondo Beach 25-75 fms.; off Avalon,Catalina in 25 fms.

(con.)

(Burch); San Pedro in 10 fms. (Lowe); So. Coronado Island (Dr. Baker); Laguna Beach (Strong); San Pedro (T.S. Oldroyd); Reef Pt., Orange Co. (A.G. Smith);

Odostomia euglypta E. Jordan,1920. Crescent City (Chace) to Trinidad
Type locality: Trinidad.

Odostomia fia Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 12,13, pl. 3, fig.8
Type locality: Todos Santos Bay, L.C.

Odostomia helga Dall and Bartsch,1909. Redondo Beach (Burch) south to San Geronimo Island, Gulf of Calif. (Lowe). Type locality: San Diego,Calif

Collecting data: Redondo Beach, shore to 25 fms.; Pt. Vicente,littoral; Corona del Mar; Ensenada,L.C.; Mission Bay; Dana Point; Punta Banda,L.C.; on Haliotis along Palos Verdes (Burch); off S. Coronado Id. in 7-14 fms.; Pacific Beach (Dr. Baker); National City(Emory); San Diego (Hemphill) (Stephens); Bird Rock (Baker); San Pedro; San Clemente Island (Lowe); San Pedro (Chace); Reef Pt ., Orange Co.; Avalon, Catalina; La Jolla (A.G Smith); San Pedroand San Diego (T.S. Oldroyd).

Odostomia heterocincta Bartsch,1912. San Diego, Calif.

Odostomia lucca Dall and Bartsch,1909. Monterey to San Diego
Type locality: San Diego, Calif.

Collecting data: Monterey Bay in 15 fms. (Gordon).

Odostomia montereyensis Dalland Bartsch,1907. Monterey to San Luis Obispo
Type locality: off Del Monte, Monterey Bay, Calif.

Collecting data: Monterey (Strong); Monterey Bay, shore to 30 fms. (A.G. Smith).; off Monterey in 15 fms. (Burch.

Odostomia oldroydi Dall and Bartsch,1909. Monterey to Coronado Islands.
Type locality: San Diego.

Collecting data: Monterey Bay, beach drift and 10 fms. (Smith & Gordon); San Pedro (T.S. Oldroyd); So. Coronado Island (Baker); San Pedro and Reef Pt. in 12 fms. (Lowe); San Pedro, Pt. Firmin; Portuguese Bend; off Pt. Vicente in 12 fms. (W.O. Gregg); White's Pt.; Reef Pt. in 10 fms.(Strong).

Odostomia oregonensis Dalland Bartsch,1907. Queen Charlotte Islands, B.C. south to Cayucos, San Luis Obispo Co. (A.G. Smith). Type locality: Cumshewa Inlet, Queen Charlotte Islands, B.C. in 10 fms.

Collecting data: Cayucos; Monterey, shore to 15 fms. (A.G. Smith);

Odostomia ornatissima (Haas), 1943. See description, pp 18-19 this issue. Zoological Series of Field Museum of Natural History, vol. 29, no. 1,1943, pp. 4-5, pl.2, a,b,c. Point Pinos, Monterey Peninsula.

Odostomia promices Dall and Bartsch,1909. San Diego ? Todos Santos Bay, L .C.
Type locality: Todos Santos Bay.

Odostomia pulcherrima Dalland Bartsch,1909. San Pedro, to San Diego.
Type locality: San Pedro.

Collecting data: San Diego (Kelsey) ; La Jolla (Chaney); White's Pt. San Pedro (A.G. Smith); San Pedro (Mrs. Baldridge) (A.G. Smith).

Odostomia pulcia Dall and Bartsch,1909. San Pedro to San Martin Island, L .C.
Type locality: San Pedro.

Collecting data: San Martin Island (Dr. Baker); S. Coronado Island (Baker); San Pedro(Lowe) (Gordon) Mrs. Baldridge); White's Point, San Pedro on Homalopoma bacula Carp. (Strong); White's Pt. (A.G. Smith); San Pedro (Chace); Portuguese Bend (W.O. Gregg).

Odostomia ritteri Dall and Bartsch,1909; Catalina Island to San Diego, Calif.
Type locality: off Catalina Island. Redondo Beach in 25 fms. (Burch)

Collecting data: Off Catalina in 30-40 fms. (Strong).

Odostomia sanctorum Dall & Bartsch,1909. Todos Santos Bay: T ype locality.
~~[illegible] La Jolla (Chaney)~~ s. to San Hipolito Pt. and Magdalena Bay(Orcutt).

Odostomia sapia Dall and Bartsch,1909. San Diego, Calif.
Odostomia thalia Bartsch,1912. . Coronado Islands.
Odostomia trachis Dall and Bartsch,1909. Monterey to San Martin Id. , L.C
Type locality: San Pedro, Calif.

Collecting data: off Redondo Beach; Punta Banda, L.C.; Arbolitos,L.C.; San Pedro breakwater; (Burch); off S. Coronado Island (Baker); off Point Firmin in 12 fms. and Santa Cruz Island (Strong); San Martin Island (Baker); Catalina Island in 35 fms. (Lowe); Mr. A.G. Smith reports that neither he nor Mac Gordon have taken this species at Monterey. The record is in question.

Odostomia tremperi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 14,15, pl. 3, fig. 1. San Clemente Island.
Odostomia vicola Dall and Bartsch,1909. Monterey (Smith & Gordon) to San Pedro. Type locality: San Pedro.
Odostomia vincta Dall and Bartsch,1909. San Pedro, Calif.

Collecting data: San Pedro (Gordon).

Odostomia virginalis Dall and Bartsch,1909. Redondo Beach (Burch) to Point Abreojos, L.C. Type locality: Todos Santos Bay, L.C.

Collecting data: Off Redondo Beach 5 to 25 fms.; Corona del Mar,; Pt. Vicente (Burch); N. Coronado Island (Frank Stephens); San Pedro (Lowe); (T.S. Oldroyd); White's Point; Reef Pt., Orange Co. (A.G. Smith); San Diego (Gordon); White's Point, San Pedro (Strong); Pt. Vicente (Gregg);

Subgenus Ividella Dall and Bartsch,1909. Type (by Orig. Desig.), Odostomia navisa Dall and Bartsch,1907.

" Odostomias marked with lamellar spiral ridges and equally strong lamellar axial ribs, both of which ornament spire and base." (Dall and Bartsch,1909, p. 172).

Odostomia navisa Dall and Bartsch,1909. San Pedro, Calif. to Scammon's Lagoon. Type locality: Scammon's Lagoon.

Collecting data: White's Point, San Pedro; Guadalupe Island (Strong); South Coronado Island in 7-10 fms. (Dr. Baker); La Jolla (Chaney); San Pedro (Lowe);(T.S. Oldroyd)1; Catalina Island in 30-70 fms. (Hanna- C.A.S.) San Diego (T.S. Oldroyd); Scammon's Lagoon (Hemphill);

Odostomia navisa delmontensis Dall and Bartsch,1907. Off Del Monte, Monterey Bay, Calif. to ? San Diego Type locality: off Del Monte

Collecting data: Monterey Bay in 10-30 fms.; San Diego (T.S. Oldroyd- " Would be inclined to question this lot with a Gordon label- subject to confirmation." However, there are several sets in the San Diego Museum so labelled, collected by Hemphill and T.S. Oldroyd.

Subgenus Miralda A. Adams, 1864. Type (by Sub. Desig. Verrill & Bush, 1900), Parthenia diadema A. Adams.

" Odostomias with very strong spiral keels between the sutures and on the base; the anterior one of which, and sometimes the next one to it, strongly crenulate; the remainder simple and acute. Base axially striate."(Dall & Bartsch,1909, p. 176).

Odostomia hemphilli Dall and Bartsch,1909. San Pedro to Point Abreojos,L.C Type locality: San Hipolito Pt., L.C.

Collecting data: Lower California localities (Strong).

Odostomia aepynota Dall and Bartsch,1909. San Pedro to Cape San Lucas. Type locality: San Pedro. Co

Collecting data: White's Pt., San Pedro; Guadalupe Island (Strong) (con.)

White's Pt. (T.S. Oldroyd); San Pedro (Lowe); No. Coronado Island (F. Stephens); So. Coronado Island (Baker); Conception Bay, L.C. (Bancroft); San Martin Island, L.C. (Baker); San Diego; White's Pt. (Gordon); Reef Pt., Orange Co. (A.G. Smith); Pt. Vicente in 12 fms. (W.O. Gregg)

Subgenus Ivara Dall and Bartsch, 1903. Type (by monotypy), Odostomia terricula Dall.

" Odostomias having feebly developed axial ribs which are usually only indicated near the summits of the whorls; spiral sculpture consisting of many subequally spaced fine lirations; summits of the whorls strongly tabulated." (Dall and Bartsch, 1909, p 179).

Odostomia terricula Dall and Bartsch, 1903. Monterey to Point Abreojos, L.C. Type locality: San Pedro, Calif.

This specific name has been generally spelled turricula. Dr. A.M. Keen advises on this : " Although Dall and Bartsch afterward said terricula was a misprint, it was used consistently in text and plate explanations, and as no derivation was given for the name, there is no internal evidence that justifies change to turricula."

Collecting data: Portuguese Bend, L.A. Co. (W.O. Gregg); Monterey Bay in 25 fms. (Smith and Gordon); San Pedro (Gordon); Reef Pt., Orange Co., (A.G. Smith); Todos Santos Bay (Orcutt); Scammon's Lagoon (Baker); San Martin Island; So. Coronado Island in 3 fms.; Bird Rock, San Diego Co.;(Baker); Del Mar (Kate Stephens); La Jolla (Kelsey); San Pedro (Lowe);

Subgenus Evalina Dall and Bartsch, 1904. Type (by Orig. Desig.), Odostomia americana Dall and Bartsch.

" Odostomias having feebly developed axial ribs which are usually only indicated near the summit of the whorls; spiral sculpture consisting of many fine lirations; summit of the whorls not tabulated." (Dall & Bartsch, 1909, p. 180).

Odostomia americana Dall and Bartsch, 1904. San Pedro, Calif. to San Martin Island (Baker). Type locality: San Pedro, Calif.

Collecting data: White's Point, San Pedro (Strong); (Chace); (Gordon); San Martin Island, L.C.; So. Coronado Island in 7-10 fms. (Baker); North Coronado Island (F. Stephens); San Pedro (Lowe);

Subgenus Iolaea A. Adams, 1867. Type (fide Dall & Bartsch), Iole scitula A. Adams.

" Shell umbilicated, marked by spiral cords, and axial riblets which cross the grooves between them." (Dall & Bartsch, 1909, p. 181.)

Odostomia amianta Dall and Bartsch, 1907. Moss Beach, San Mateo Co. to Point Abreojos, L.C. Type locality: Point Abreojos, L.C.

Collecting data: Off Monterey in 40 fms.; off Catalina Island in 25 fms.; off Redondo Beach in 5-75 fms.; off Santa Cruz Island in 50 fms. (Burch); off Reef Pt. in 10 fms. (Strong); off Pt. Vicente in 12 fms. (W.O. Gregg); Monterey Bay, shore to 30 fms. (Smith and Gordon); San Pedro (Gordon); San Diego (Hemphill); San Pedro (Lowe);

Odostomia eucosmia Dall and Bartsch, 1909. San Pedro, Calif. to Point Abreojos Type locality: Point Abreojos, L.C.

Collecting data: White's Pt., San Pedro(Strong); (A.G. Smith); (Gordon); (Lowe); Reef Pt. Orange Co. (A.G. Smith); bet. Pt. Firmin & White's Pt.

(con.)

(W.O. Gregg); So. Coronado Island; San Martin Island,L.C.; Bird Rock,San Diego Co.; La Jolla (Baker); San Diego (Hemphill);

Subgenus Menestho Moller,1842. Type (by monotypy), Turbo albulus Fabricius.

" Shell not umbilicated, marked by moderately well developed and usually equally spaced spiral cords; axial sculpture reduced to mere lines of growth which frequently appear as very slender raised threads in the grooves between the cords." (Dalland Bartsch 1909, p. 184.).

See page 47- for additional species.

Odostomia amilda Dall and Bartsch,1909. San Diego to San Martin Island,L.C (Strong). Type locality: San Diego, Calif.

Collecting data: San Diego (Gordon); San Martin Island (Strong);

Odostomia enora Dalland Bartsch,1909. San Pedro, Calif.

Odostomia exara Dall and Bartsch,1907. Monterey, Calif. to San Diego(?) Type locality: Monterey.

Collecting data: Monterey Bay in 5-15 fms. (A.G. Smith); one lot in the Gordon collection from San Diego labelled cf. exara.

Odostomia excisa Bartsch,1912. Catalina Island, Calif.

Odostomia farma Dalland Bartsch,1909. Catalina Island to La Jolla (Chaney). Type locality: Catalina Island.

Odostomia fetella Dalland Bartsch,1909. Malaga Cove, Santa Monica Bay (Burch) to San Ignacio Lagoon, L.C. Type locality: San Diego.

Collecting data: Malaga Cove, littoral; Mission Bay from eel grass; Todos Santos Bay (Burch); Newport Bay on oysters (Strong); (A.G. Smith); Anaheim Bay (Chace) (A.G. Smith) (W.O. Gregg- on Ostrea lurida); Reef Pt. Orange Co. (A.G. Smith); San Diego (Gordon); San Pedro; Anaheim; (Lowe); Bird Rock; San Diego (Baker); San Pedro (Chace);

Odostomia gloriosa Bartsch,1912. San Diego, Calif. to San Hipolito Pt.,L.C Type locality: San Diego.

Collecting data: San Diego (Gordon);

Odostomia harfordensis Dall and Bartsch,1907. Port Harford, Calif.

Odostomia hypocurta Dall and Bartsch,1909. Bristol Bay,Bering Sea in 33 fms.

Odostomia phareida Dall and Bartsch,1907. Queen Charlotte Islands, B.C.

Subgenus Evalea A. Adams, 1860. Type (by Sub. Desig. Verrill and Bush), 1900), Evalea elegans A. Adams.

" Odostomias having the surface marked by fine incised spiral lines." (Dalland Bartsch,1909, p. 192).

Odostomia aleutica Dall and Bartsch,1909. Captain's Bay, Unalaska Island,Al.

Odostomia altina Dalland Bartsch,1909. Off San Diego, Calif. in 359 fms.

Odostomia amchitka Dall and Bartsch,1909. Amchitka Island, Aleutians to Forrester Island, Alaska (Willett). Type locality: Constantine Harbor, Amchitka Island, Alaska.

Collecting data: Shuyak Strait, Afognak Island, and Unalaska Island (Eyerdam); Ellamar, Alaska (Dr. Baker); Bear Bay, Peril Straits (Kate Stephens);

Odostomia angularis Dall and Bartsch,1907. Sitka, Alaska to Monterey. Type locality: Nanaimo, B.C.

Collecting data: Off Friday Harbor, Puget Sound (T. Kincaid); Monterey Bay, shore to 15 fms. (Smith and Gordon); Puget Sound (Lowe) (T.S. Oldroyd); Nanoose Bay, B.C. (Oldroyd);

Odostomia atossa Dall,1908. San Pedro, Calif.

Odostomia bachia Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 17-18, pl.2, f.7
Type locality: San Clemente Island.

Odostomia baldridgae Bartsch,1912 San Pedro, Calif.

Odostomia baranoffensis Dall and Bartsch,1909. Baranoff and Admiralty Islands, Alaska to Windfall Harbor, Alaska (Kate Stephens). Type L.: Bear Bay,Peril St.

Odostomia barkleyensis Dall and Bartsch,1910. Barkley Sound, Vancouver Id.

Odostomia calcarella Bartsch,1912. Off Santa Rosa Island in 48 fms. and off Reef Point, Orange Co. in 10 fms. (Strong). Type Loc.: off Santa Rosa Id.

Odostomia californica Dall and Bartsch,1909. Monterey Bay in 10-30 fms. (Smith & Gordon) to San Martin Island, L.C. (Baker). Type locality: Ocean Beach, Calif.

Collecting data: San Diego (Gordon); Reef Pt., Orange Co. (A.G. Smith); La Jolla (Chaney); So. Coronado Island in 4-14 fms. (Baker); on Kelletia kellettii in deep water off Catalina Island (Field) (Gregg); off Reef Point in 10 fms. (Strong);

Odostomia callimene Bartsch,1912. San Pedro, Calif. to Reef Point,Orange Co. (Strong). Type locality: San Pedro.

Collecting data: Off Reef Pt. in 10 fms. (Strong); off Point Vincente in 12 fms. (Dr. W.O. Gregg); Reef Pt., Orange Co. in 12 fms. (Gordon);

Odostomia calliope Bartsch,1912. Off La Jolla, San Diego Co. in 199 fms.

Odostomia capitana Dall and Bartsch,1909. Captain's Harbor, Unalaska to Kodiak, Alaska. Type locality: Captain's Harbor.

Odostomia cassandra Bartsch,1912. Skidegate, Queen Charlotte Islands, B.C.

Odostomia clessini Dall and Bartsch,1909. Baranoff and Admiralty Islands to Sitka, Alaska (Dall). Type locality: Bear Bay, Peril Straits, Baranoff Id.

Collecting data: Bear Bay, Peril Straits (Stephens)

Odostomia columbiana Dall and Bartsch,1907. Forrester Island, Alaska (Willett) to Puget Sound. Type locality: Victoria, Vancouver Island, B.C.

Collecting data: off San Juan Islands, Puget Sound (T. Kincaid); there is a set in the San Diego Museum collected by Dr. Fred Baker at La Jolla, San Diego Co. labelled as this species- such an extention should be checked; Puget Sound (T.S. Oldroyd); Victoria, B.C. (Eyerdam).

Odostomia cookeana Bartsch,1912. Ellamar,Alaska to Forrester Island (Willett) Type locality: Ellamar. Coll. Data: Ellamar,Alaska (Baker). /Olga,Wsn.(Gregg

Odostomia cypria Dall and Bartsch,1910. Skidegate, Queen Charlotte Ids.,B.C.

Odostomia deliciosa Dall and Bartsch,1907. Barkley Sound, Vancouver Island to Monterey (Smith). Type locality: Barkley Sound.

Collecting data: Pt. Reyes (W.O. Gregg); Monterey Bay in 10-25 fms. (Smith and Gordon);(Det. by P. Bartsch, U.S.N.M.); Queen Charlotte Islands (T.S. Oldroyd);(Lowe); Ballard Beach, Seattle, Wash. (Dr. Baker);

Odostomia donilla Dall and Bartsch,1909. Santa Monica, Calif. (Burch) to San Martin Island, L.C. (Dr. Baker). Type locality: San Pedro.

Collecting data: Santa Monica, shore to 10 fms.; wharf pilings under Venice Pier and also Playa del Rey pier; Redondo Beach on Mytilus on wharf pilings; same from Crystal Pier, San Diego (Burch); San Diego (Gordon); Anaheim Bay under mussels (Chace); Reef Pt., Orange Co. and White's Pt. (A.G. Smith); San Diego (Chaney)(K. Stephens) (Baker); off Reef Pt. in 10 fms. (Strong); Pt. Reyes, Calif. (Gregg);

Odostomia edmondi E. Jordan,1920. Trinidad, California.

Odostomia esilda Dall and Bartsch,1909. Off San Diego in 359 fms.

Odostomia eyerdami Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 18-19,pl.4,f.1.

Collecting data: Shuyak Strait, Afognak Island,1924 under stones (Eyerdam);

Odostomia franciscana Bartsch,1917. San Francisco Bay, Calif.

Collecting data: S.F. Bay (Albatross, C.A.S.); drift, Alameda Pier (A.G. Smith).

Odostomia gravida Gould,1852. Monterey to San Diego. Type Loc.: Santa Barbara

Collecting data: Monterey (Cooper); San Diego(T.S. Oldroyd) (Hemphill); La Jolla (Chaney); Anaheim Bay (Lowe); Monterey (Strong);

Odostomia hagemeisteri Dall and Bartsch,1909. Hagemeister Island,Bering Sea

Odostomia herilda Dall and Bartsch,1909. Off Santa Cruz Island and off Redondo Beach (Burch) to San Diego. Type locality: San Diego.

Collecting data: off Redondo Beach in 75 fms.; off Santa Cruz Island in 50 fms. (Burch); off Catalina Island in 30-40 fms. (Strong).

Odostomia hypatia Dall and Bartsch,1912. Skidegate, Queen Charlotte Island,

Odostomia inflata Carpenter,1864. Raspberry Island, Alaska,1945 (Eyerdam) to Monterey, Calif. Type locality: Neah Bay, Wash.

Dr. A. Myra Keen advised on this name " Crediting Odostomia inflata to Dalland Bartsch in Bull. 112 was a typographical error, for it was clearly described by Carpenter and was credited to him by Dalland Bartsch in the 1907 reference." Mr. Allyn G. Smith sent in the following data: " O. inflata dates from Carpenter 1864 (Rept. British Assoc. Adv. Sci. for 1863, publ. Aug. 1864) in which he gives the usual meager description and cites the species from he Farallone Ids. (Darbishire). See Rerint, page 144. In 1865 (P.Z.S., p. 7, Reprint p. 285) he described it more fully and gave localities as " Santa Barbara (Jewett); Farraleone (sic.) Islands, in cavities in Haliotis (teste R.O. Darbishire); near San Francisco (Rowell); Neah Bay (Swan)." Dalland Bartsch redescribed it, 1907."

Collecting data: Monterey (Cooper) ; Monterey (Gordon);(Lowe); Oakland, Calif. (Hemphill); Orcas Island, Puget Sound (Baker);

Odostomia io Dall and Bartsch,1909. Santa Rosa Island to San Diego(Kelsey) Type locality: Santa Rosa Island, Calif. / to Todos Santos Bay (Burch)

Collecting data: dredged off Ensenada, L.C. in 15 fms.; off Santa Cruz Island in 50 fms.; off Redondo Beach in 25-50 fms.; off Santa Monica, in 15 fms. (Burch); Newport (Gordon); Whites Point, San Pedro (Strong); Bird Rock, San Diego Co. (Baker); San Pedro and Portuguese Bend (W.O. Gregg);

Odostomia jewetti Dall and Bartsch,1907. Santa Barbara, Calif.

Odostomia kadiakensis Dall and Bartsch,1909. Kodiak Island, Alaska.

Collecting data: Kanatak Lagoon,Portage Bay, Alaska in 6 fms. (Hanna,CAS)

Odostomia killisnooensis Dall and Bartsch,1909. Killisnoo, S.E. Alaska.

Odostomia minutissima Dalland Bartsch,1909. Off Redondo Beach (Burch) to Point Abreojos, L.C. Type locality: San Diego, Calif.

Collecting data: off Redondo in 75 fms. mud bottom; off Ensenada,L.C. in 50 fms. (Burch); Ballast Point, San Diego in 8 fms. ; South Coronado Island (Baker);

Odostomia movilla Dalland Bartsch,1909. Off San Diego in 359 fms.

Odostomia nemo Dalland Bartsch,1909. Off Santa Monica (Burch) to Todos Santos Bay (Burch). Type locality: San Diego.

Collecting data: off Santa Monica in 15 fms.; off Avalon, Catalina Id. in 25 fms.; off Redondo Beach in 25 fms.; off Ensenada, Mexico in 15 fms. (Burch); San Pedro (; San Diego (Gordon); South Coronado Island in 10-14 fms. (Dr. Baker); off Reef Point in 12 fms. (Strong);

Odostomia notilla Dall and Bartsch,1909. Catalina Island, Calif. and off Point Vicente in 12 fms. (Gregg.) Type locality: off Catalina.

Odostomia nunivakensis Dalland Bartsch,1909. N. end of Nunivak Id.,BeringS.

Odostomia obesa Dall and Bartsch,1909. Monterey (Smith and Gordon) to San Pedro. Type locality: San Pedro.

Collecting data: Dredged off Redondo Beach in 75 fms.; off Point Vincente in 40 fms. (Burch); off Point Vincente in 12 fms. (Gregg); Monterey Bay, shore (Smithand Gordon); Point Vincente (Strong);

Odostomia phanea Dalland Bartsch,1907. Monterey to San Diego (Gordon). Type locality: Monterey.

Collecting data: From backs of Haliotis at both Montereyand Morro Bay : (Burch); Monterey 0-25 fms. on rocks and backs of abalones (Smith and Gordon); Cayucos; San Diego (Gordon); La Jolla (Chancy); Montereyand near Morro (Strong);

Odostomia phanella Dall and Bartsch,1909. Santa Monica (Burch) to Todos Santos Bay (Burch). Type locality: San Pedro.

Collecting data: off Santa Monica in 10 fms.; off Redondo Beach 10-25; Punta Banda, L.C. (Burch); off South Coronado Island in 14 fms. (Dr. Baker); San Pedro (Lowe); there is a set in the San Diego Museum collected by Hemphill at Monterey with this label- it is not thought this species ranges so far n north; White's Point, San Diego (A.G. Smith); San Diego (Gordon); Isthmus Cove, Catalina Island (Strong).

Odostomia pratoma Dalland Bartsch,1909. Off Santa Cruz Island and Redondo Beach (Burch) to Catalina Island (Strong). Type locality: Santa Rosa Island in 50 fms.

Collecting data: off Redondo Beach 50-100 fms.; off Avalon, Catalina Island in 35 fms; off Santa Cruz Island in 50 fms. (Burch); off Catalina in 30-40 fms. (Strong); (Lowe).

Odostomia profundicola Dalland Bartsch,1909. Point Vicente to San Diego in deep water. Type Loc.: off San Diego in 359 fms.

Odostomia quadrae Dall and Bartsch,1910. Drier Bay, Knight Island,Alaska to Barkley Sound, Vancouver Island, B.C. Type locality: Barkley Sound.

Collecting data: Nanoose Bay, B.C.; Departure Bay, B.C. (T.S. Oldroyd); Olga Island, Puget Sound (Bakwr); Decatur Island near Olga, Wash. (Engberg).

Odostomia raymondi Dalland Bartsch,1909. Catalina Island.

Collecting data: Catalina Island 30-40 fms. (Strong) (Lowe) (; " On e lot in the Gordon collection from Monterey Bay, 2 fms., labelled cf. raymondi We are not listing this species as the identification is uncertain." (A.G. Smith).

Odostomia resina Dalland Bartsch,1909. Arch Beach, Calif. to San Diego Type locality: Arch Beach

Collecting data: Ballast Point, San Diego dredged (Dr. F. Baker); Point Loma from Haliotis (Baker);

Odostomia santarosana Dalland Bartsch,1909. Santa Rosa Island to San Diego Type locality: Santa Rosa Island.

Collecting data: San Diego (Kate Stephens).

Odostomia septentrionalis Dalland Bartsch,1909. Unalaska Island, Alaska

Odostomia serilla Dalland Bartsch,1909. Carpenteria, Santa Barbara Co. (W.O. Gregg) south to Todos Santos Bay (Burch). Type Loc.: Off San Diego.

Collecting data: Off Ensenada in 15 fms.; from pilings of Crystal Pier, San Diego (Burch); Newport Bay on Mytilus (Strong); San Pedro (Lowe); Ballast Point, San Diego dredged (Dr. Baker); Carpenteria, Santa Barbara Co., Venice, el Rey. In each locality on Mytilus californicus. (W.O. Gregg).

Odostomia sitkaensis Clessin,1900. Sitka, Alaska to Japan (Baker).

Collecting data: Abashiri,Hokkaido, Japan (Dr. F. Baker);

Odostomia stephensae Dall & Bartsch,1909. Drier Bay, Pr. Wm. Snd., Alaska (Eyerdam) to Barkley Sound, B.C. Type locality: Bear Bay, Peril Straits.

Coll. Data: Bear Bay (Baker); Departure Bay, B.C.(Oldroyd);

Odostomia skidegatensis Bartsch,1912. Prince William Sound (Alaska,(Eyerdam) to Queen Charlotte Islands, B.C. to Trinidad,Calif. Type Loc.: Skidegate,B.C.

Collecting data: Crescent City, Calif. (Chace); Queen Charlotte Ids.((T.S. Oldroyd); Martaga Harbor, B.C. ("Oldroyd) (Strong); Port Orchard, Kitsap Co., Wash. (Eyerdam).

Odostomia spreadboroughi Dall and Bartsch,1910. Barkley Sound, Vancouver Is. B.C.

Odostomia strongi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 19-20, pl.4, fig.4. Type locality: " from abalone at Catalina Island."

Collecting data: Isthmus Cove, Catalina Island (Strong- paratypes); Catalina Island (Lowe); (Gordon);

Odostomia tacomaensis Dall and Bartsch,1907. Tacoma, Puget Sound, Wash.

Odostomia tenuisculpta Carpenter, 1864. Barkley Sound,Vancouver Island to Lower California. Type locality; Neah Bay, Wash.

Collecting data: From Haliotis at Avila, San Luis Obispo Co.; from Haliotis fulgens at Malaga Cove, L.A. Co.; off Santa Cruz Island in 4 fms.; off Redondo Beach 10-15 fms.; Todos Santos Bay, L.C. (Hemphill); Pt. Loma; Ocean Beach (Dr. Baker); Long Beach (Lowe); San Pedro (Oldroyd); Monterey Bay (Berry); Isthmus Cove, Catalina (Strong); Portuguese Bend (W.O. Gregg); common on backs of red abalones 3 mi N. of Ft. Ross (A.G. Smith); Monterey Bay 0-15 fms. (Smith and Gordon- Det. by P. Bartsch, U.S.N.M.); San Diego (Gordon); Carmel off abalones; San Pedro; (Gordon); According to D. & B. O. straminea is the smooth southern form.(A.G. Smith).

Odostomia thea Bartsch,1912. Malaga Cove, L.A. Co. (Burch) south to San Diego (K. Stephens). Type locality: San Pedro.

Odostomia tillamookensis Dall and Bartsch,1907. Off Tillamook, Ore. in 786 f.

Odostomia unalaskensis Dall and Bartsch,1909. Captain's Harbor, Unalaska Id., Alaska. Coll. Data: Shuyak Strait,Afognak Id.,1924 (Eyerdam).

Odostomia valdezi Dall and Bartsch,1907. Puget Sound (Baker) south to San Diego (Kelsey) (Gripp). Type locality: Monterey.

Collecting data: Off Monterey in 40 fms. shel (Burch); Monterey Bay 10-25 fms. (Smith and Gordon- Det. by P. Bartsch, U.S.N.M.); off Santa Monica in 15 fms.; off Redondo Beach in 25 fms. (Burch).

Odostomia vancouverensis Dall and Bartsch,1910. Forrester Island (Alaska, (Willett) to Barkley Sound, B.C. Type locality: Barkley Sound.

Odostomia whitei Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 19, pl.4, fig.3. Type locality: Point Firmin, Calif. Paratypes in A.M. Strong Coll.

Odostomia willetti Bartsch,1917. Drier Bay, Knight Island, Prince Wm. Snd., Alaska (Eyerdam) to Queen Charlotte Islands, B.C. (Oldroyd) (Lowe). Type locality: Prince of Wales Island, Alaska.

Collecting data: Ketchikan, Alaska (Willett);

Odostomia youngi Dall and Bartsch,1910. Barkley Sound, Vancouver Island, B.C.

Odostomia chinooki Bartsch,1927. Olga, Washington.

Collecting data: Mud Bay, Thurston Co., Wash.,1925 on Ostrea lurida (Eyerdam); Olga, Wash. (Strong).

Subgenus Amaura Moller,1842. Type (by monotypy), Amaura candida Moller.

Dr. A. Myra Keen advises though as follows " Amaura Moller,1842 is preoccupied by Amaura Geyer,1837 "

" Very large, usually inflated Odostomias, the sculpture of which consists of very fine lines of growth and still finer wavy closely placed spiral striations." (Dall and Bartsch,1909, p. 218).

Odostomia arctica Dall and Bartsch, 1909. Seahorse Islands, Arctic Ocean south to Bristol Bay, Bering Sea. Type locality: Hagemeister Island, Bering S.

Odostomia avellana Carpenter, 1865. Neah Bay, Wash. to San Martin Id., L.C. (Baker). Type locality: Neah Bay.

Collecting data: Orcas Island, Puget Sound in 10-30 fms.; San Martin Island, L.C. (Dr. F. Baker); Olga, Wash. (Engberg) (Gregg).

Odostomia beringi Dall, 1871. Norton Sound, Alaska.

Odostomia canfieldi Dall, 1908. Barkley Sound to San Martin Island, L.C. (Baker). Type locality: Monterey.

Collecting data: Victoria, B.C. (Eyerdam); Monterey Bay, drift and 0-40 fms. (Smith and Gordon) (Iden. P. Bartsch, U.S.N.M.); White's Point; 125 f. off La Jolla (Gordon); San Martin Id., L.C.; Ocean Beach; So. Coronado Id. (Dr. F. Baker); Olga, Wash. (Engberg- Gregg).

Odostomia eldorana Bartsch, 1912. Kodiak, Alaska.

Odostomia elsa Dall and Bartsch, 1909. Kodiak Island, Alaska. Redondo(Burch)

Odostomia engbergi Bartsch, 1920. San Juan Islands, Gulf of Georgia.

Collecting data: Olga Washington (Engberg);

Odostomia farallonensis Dall and Bartsch, 1909. Farallone Islands to off Redondo Beach, Calif. (Burch). Type Locality: off the Farallone Islands.

Mr. A.M. Strong comments on this species as follows: " About the only difference between this and A. helena Bartsch is in the amount of shouldering to the whorls and the locality. It is doubtful if a satisfactory separation of the two could be made without type or topotype material to work with. The range is open to question."

Collecting data: Monterey Bay (Keen); off Redondo Beach in 25-100 fms. and off Avalon, Catalina Island in 35 fms. (Burch);

Odostomia gouldii Carpenter, 1864. Neah Bay, Wash. south to San Diego Type locality: Neah Bay, Wash.

Collecting data: San Diego (Dr. F. Baker) (Gripp); off Friday Harbor, Wash. (T. Kincaid) (Burch).

Odostomia grippiana Bartsch, 1912. Nanaimo, B.C.

Odostomia helena Bartsch, 1912. Off Redondo Beach (Burch) to San Pedro an Catalina Island. Type locality: San Pedro.

Collecting data: Dredged off Malaga Cove in 15 fms.; off Redondo Beach in 15-50 fms.; off Avalon, Catalina Island in 25 fms. (Burch); Catalina in 35 fms. (Lowe)

Odostomia iliuliukensis Dall and Bartsch, 1909. Unalaska Island, Alaska.

Collecting data: Iliuliuk Harbor, Unalaska Id. (Eyerdam)

Odostomia kennerlyi Dall and Bartsch, 1907. Sawmill Bay, Prince Wm. Sound, Alaska (Gordon) south to Monterey, Calif. Type Loc.: Nanaimo, B.C.

Collecting data: Ballard Beach, Seattle, Wash. (Eyerdam); Sitka, Alaska (Gordon); Puget Sound (Oldroyd); Monterey Bay in 10-30 fms. (Smith & Gordon); Santa Catalina Island- 1 large spec. (Lowe);

Odostomia krausei Clessin, 1900. (krausei) Kodiak to Killisnoo, Alaska Type locality: Verbretung, Japan.

Collecting data: Shuyak Strait, Afognak Id., Alaska (Eyerdam);

Odostomia lastra Dall and Bartsch, 1909. Catalina Island to San Diego, Calif. Type locality: U.S.B.F. Sta. 2917, in 90 fms. off southern Calif.

Odostomia martensi Dall and Bartsch, 1906. Killisnoo, Alaska.

Odostomia noratora Dall and Bartsch, 1909. Off Point Reyes, Calif.

Odostomia nota Dall and Bartsch, 1909. Santa Rosa Island to San Diego. Type locality: San Diego.

Collecting data: Mr. A.M. Strong recently told me that this species is to be collected by pulling up the eel grass by the roots and found deep in

(con.)

the roots, perhaps as deep as six inches. (Burch); White's Point, San Pedro; Point Loma, San Diego in grass grown tide pools (Strong); San Diego (Kelsey) (Gordon); San Pedro (Chace)(Lowe); Anaheim Bay (Chace); Pt. Loma (Baker); White's Pt. and Reef Pt., Orange Co., common in eel grass roots at minus tides (A.G. Smith); San Pedro (Gragg).

Odostomia nuciformis Carpenter,1864. Neah Bay, Wash. to San Diego. Type locality: Neah Bay. Collecting data: San Diego; Pacific Beach; off Coronado Hotel in 10 fms. (Dr. F. Baker); La Jolla (Bristol)(San Diego Museum).

Odostomia orcia Dall and Bartsch,1909. Santa Rosa Island to San Diego. Type locality: Santa Rosa Island.

Collecting data: off Santa Monica in 5 fms.; off Malaga Cove in 10 fms ; off Redondo Beach in 25 fms. (Burch- Det. by A.M. Strong); off Catalina in 30-40 fms. (Strong); San Diego (Baker) (Kelsey); Pt. Loma (K. Stephens); La Jolla (Chaney); " with nota in eel grass roots, Reef Pt., Orange Co., but scarce. There is some doubt about this identification as no typical specimens of orcia have been available for comparison (A.G. Smith);

Odostomia pesa Dall and Bartsch,1909. Shuyak Strait,Afognak Island,Alaska (Eyerdam) to Kodiak Island. Type locality: Kodiak Island.

Odostomia sanjuanensis Bartsch,1920. San Juan Islands, Gulf of Georgia

Collecting data: off Friday Harbor (Oldroyd);

Odostomia satura Carpenter,1864. Neah Bay, Wash. to San Diego. Type locality: Neah Bay.

Collecting data: San Diego (Baker) (Gordon); Olga, Wash. (Engberg-G Gregg); San Pedro and Catalina Island (Lowe);

Odostomia sillana Dall and Bartsch,1909. Captain's Bay,Unalaska Island, Alaska.

Odostomia subglobosa Bartsch,1912. San Diego and Coronado Islands in to/ 15 fms. (Gordon). Type locality: San Diego./Monterey 20f(Burch) Det. Strong

Odostomia subturrita Dall and Bartsch,1909. Santa Barbara, Calif. to Todos Santos Bay. Type locality: San Pedro.

Collecting data: Dredged off Santa Monica, Calif. in 10 fms. (Burch- Det. by A.M. Strong); San Diego (Gordon); La Jolla in 125 fms. (Gordon); White's Point, San Pedro and Point Loma, San Diego in grass grown tide pools (Strong); off Coronado Hotel in 10 fms. (Baker); San Pedro (Baker)(Lowe). White's Point (Gragg).

Odostomia talpa Dall and Bartsch,1909. Drier Bay, Knight Island and Raspberry Island, Alaska (Eyerdam) to Maple Bay, Vancouver Island, B.C. (Bartsch, Nautilus, vol. 24, p. 114). Type locality: Molo Harbor, Alaska.

Collecting data: Departure Bay, B.C. (Oldroyd); Windfall Harbor,Alaska (K. Stephens); off Friday Harbor (T. Kincaid) (Burch).

Odostomia washingtonia Bartsch,1920. (Odostomia washingtona Bartsch,1927- Proc. U.S.N.M. vol. 70, pp. 20-21, pl.4, f. 10). Type locality: off San Juan Islands, Gulf of Georgia.

Subgenus Heida Dall and Bartsch,1904. Type (by original designation), Syrnola caloosaensis Dall.

" Shell without axial or spiral sculpture beyond mere lines of growth and exceedingly fine spiral striations; peritreme continuous, aperture rissoid." (Dall and Bartsch,1909, p. 231).

Odostomia kelseyi Bartsch,1912. San Diego.

Subgenus Odostomia s.s.

Odostomia farella Dall and Bartsch, 1909. Off Long Beach, Calif.

Odostomia dinella Dall and Bartsch, 1909. Off Redondo, Calif.

Collecting data: off Redondo in 25 fms. (Burch)

Odostomia coronadoensis Dall and Bartsch, 1909. Off Coronado Beach, San Diego.

Odostomia orcutti Bartsch, 1917. San Diego, Calif.

Additions and Corrections

Subgenus Menestho.

Odostomia aequisculpta Carpenter, 1864. Dall and Bartsch place it under the subgenus Menestho - p. 191, 1909. Dr. A. Myra Keen adds it to our fauna on a listing by Eric Jordan who gave the range from San Diego southward in Bull. So. Calif. Acad. Sci. vol. 23, pt. 5 (Oct. 25, 1924), pp. 145-146.

Genus Pyramidella

Subgenus Longchaeus (Supplementing data on page 20- this issue)

The following data from Mr. A.G. Smith.

Pyramidella (Longchaeus) adamsi Carpenter- Monterey, Calif. a young specimen (D. & B.). Dall and Bartsch say that this shell is smaller and more slender than the typical form and may prove to be a new species. This record has not subsequently been confirmed by dredging by Gordon, Hanna or myself.

Pyramidella (Longchaeus) mexicanus Dall and Bartsch - Terminal Island, San Pedro (A.G. Smith); San Diego (T.S. Oldroyd).

Odostomia (Evalea) pratoma Dall and Bartsch- See p. 43- this issue.

The following note from Mr. A.M. Strong was overlooked " This seems to be plentiful in deep water. In the description it is said to sometimes have a faint umbilical chink but it is placed in the key as not umbilicated. In your series some specimens seem to have a distinct open umbilicus. The deeply sunken nucleus giving the shell a truncated appearance is distinctive."

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A few of the more important references to consult in studying this group follow. The Dall and Bartsch and later the Bartsch papers contain many very fine keys to both genera and species.

Dall and Bartsch, " Synopsis of the Genera, Subgenera, and Sections of the Family Pyramidellidae," Proc. Biol. Soc. Washington, vol. 17, pp. 1-16, Feb. 5, 1904.

Dall and Bartsch: " Notes on Japanese, Indo-Pacific, and American Pyramidellidae", Proc. U.S.N.M., vol. 33, pp. 321-369, pls. 17-26, 1906.

Dall and Bartsch: " The Pyramidellid Mollusks of the Oregonian Faunal Area", Proc. U.S.N.M., vol. 33, pp. 491-534, pls. 44-48, Dec. 31, 1907.

Dall and Bartsch: " A Monograph of West American Pyramidellid Mollusks", U.S. Nat. Mus. Bull. 68, 258 pp, 30 pls., 1909.

Bartsch, Paul : " Pyramidellidae of New England and the Adjacent Region", Proc. U.S.N.M., vol. 34, no. 4, pp 67-113, pls. 11-14, Feb. 1909.

Bartsch, Paul : " Additions to the West American Pyramidellid Mollusk Fauna, with Descriptions of New Species.", Proc. U.S.N.M., vol. 42, pp. 261-289, pls. 35-38, May 17, 1912.

Bartsch, Paul : " New West American Marine Mollusks", Proc. U.S.N.M. No. 2660, vol. 70, pp. 1-36, pls. 1-6, 1927.

Minutes of the Long Beach Shell Club- May,1946 meeting

The Long Beach Shell Club was called to order by the president, Mr. Baker at 2:40 P.M., May 12, in the Children's Room of the public library.

The minutes were read and accepted. A member told of meeting Mr. Kanakoff, who has a new shell interestand will tell us about it in the future. Five members of the club will arrange for a meeting to list and catalog topical material in the numerous magazines the club has at the librarians home so each may have a list.

Mr. Ulrich and Mr. Chace reported good collecting at Point Firmin and Pt. Vicente- Gadinia reticulata, Acmaea scabra, Antigona fordi and Astraea undosa. A very large specimen of Lottia gigantea was found too. Dr. Lloyd at the San Pedro museum is increasing that collection very greatly.

Program chairman, Mrs. Libby, graciously introduced Dr. Dunkle, who took the topic " Fossil Shells in the Long Beach Schools". He told how the study of shells was taken up in the elementary division by individual teachers, but that in the Junior and Senior High Schools there was no definite place for it, and the large amount of new material there, where interest might be aroused due to the age level, crowded out the subject. As a part of the work in Junior College, in a shell club and in the study of geology there is a definite place, but the fossil shells are the ones studied, showing the relationship of shells to the different life strata and aiding in interpretation of changes ih life. Among points brought out are the following: Mollusks and Brachiopods are found at life's beginning; with each emergence of earth from shallow seas, competition in life groups produced variations; large fossil Ammonites were present in abundance in the Jurrasic times, good examples having been available at Friday Harbor. He reported that his science club has found Pleistocene fossils, 90% of them being modern shells; that representatives of the Cretaceous timeare present in Silverado Canyon, and that a few Ammonites were located in the Santa Ana Hills, west of this canyon. Club members reported finding of fossil shark's teeth in Hilltop Quarry, San Pedro, and immensely large Ammonites in Carmel,Utah.

We all appreciated Dr. Dunkle's talk, and found great pleasure in eaxmining the large number of specimens so beautifully mounted. It might be of interest to others not present, that this group dyed the cotton background blue, which made the specimens show much better.

After announcing the talk by Mr. Bailey on " Collecting on the Great Barrier Reef" for next month, Mr. Baker adjourned the meeting.

Ruth E. Eaton, Secretary.

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The interesting monthly bulletin of the Auckland Museum Conchology Club is at hand for their March meeting. Our New Zealand friends are doing some very fine work.

With the notes of their meeting an interesting letter arrived from Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand. Those interested in exchanges will find Mrs. Worthy a valuable correspondent.

The monthly bulletin for May of the Natural History Museum of San Digo is at hand. Among other interesting notes is one by Dr. Mayr who estimates the approximate number of known species as follows: Mollusks, 88,000; Mammals 3,500; Reptiles and Amphibians 5,500; Fishes, 18,000; Insects, 750,000; Crustaceans, 25,000. We note with a bit of envy that Mr. Karl W. Kenyon with Woody Williams are on a trip down the coast for several months collecting in Kenyon's auxiliary powered sail boat " The Seven Seas,".

Turridae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

August 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or more.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965

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Turridae

We passed up this family group hoping to have Dr. Bartsch's monograph in hand by the time we had completed the other groups. Mr. Allyn G. Smith is preparing our report on the Amphineura. It seems that we may as well include our locality records and all data we have on the Turridae. There is no doubt but that Dr. Bartsch will make many changes in the nomenclature. It seems to be generally agreed that Dr. Dall's usage will have to be changed materially, probably by the addition of a great many more genera.

A few of the more important recent works on the Turridae follow:

Powell, A.W.B. " The New Zealand Recent and Fossil Mollusca of the Family Turridae", Bulletin of the Auckland Institute and Museum, No. 2. In this work Dr. Powell gives a list " Synopsis of Turrid Generic Names" in which he gives the type species and synonymy. His data will be freely used in this paper.

Bartsch, Paul and Rehder, Harald Alfred " Mollusks Collected on the Presidential Cruise of 1938", Smithsonian Miscellaneous Collections, vol. 98, no. 10.

Bartsch, Paul and Rehder, Harald A. " New Turritid Mollusks from Florida", Proc. of the U.S. Natl. Mus., vol. 87, no. 3070, pp 127-138, pl. 17.

Bartsch, Paul, " The Nomenclatorial Status of Certain Northern Turritid Mollusks" Proc. of the Biological Soc. of Washington, vol. 54, pp. 1-14, Feb.26,1941.

Bartsch, Paul, " Some Notes Upon West American Turrid Mollusks.", Proc. Biol. Soc. Wash., vol. 57, pp. 25-30, June 28,1944.

Bartsch, Paul, " Some Turrid Mollusks of Monterey Bay and Vicinity", Proc. Biol. Soc. Wash., vol. 57, pp. 57-68, Oct. 31,1944.

Bartsch, Paul, " The West Pacific species of the molluscan genus Aforia.", Journal of the Washington Academy of Sciences, vol. 35, no. 12, Dec. 15,1945.

The following note from Dr. Paul Bartsch will be of interest:" I have gone over your MS and have put in a few notes (a very few). I am enclosing several small papers which will help you to partly understand the complexity of the problem. There are today close to 500 genera known in the family and most of the names for the larger groups have been terribly abused. I believe as I stated to you before. The thing is a complete mess which I hope my studies of the anatomic structures as far as available, will help to clear up. I have finished two of the three subfamilies and am deep in the third. The part fin-

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-ished covers a two-foor space on my shelves holding the manuscript in folders, so you see it is not just a simple matter of making a few changes in the list of names that you have but I hope that the thing that I am doing will furnish a new basis for a more sound classification. Most of the groups are not restricted to the west coast of America, but are present in other parts of the world and therefore assume an entirely different aspect from that which we would glean if we were dealing with east Pacific forms only. However, I don't wish to enter into a long discussion of this problem at the present time, but merely make this statement to point out that it would be impossible for me to give you a revision even of the parts finished at the present time. I wish that the entire paper were finished sothat you could have the concept as I see things, but there are a good many things in our daily routine that keep one from working at a thing steadily."

As observed above no two authors seem to agree on the nomenclature of this family. However, the following keys to genera and subgenera should be of some interest. They are taken from Mr. A.M. Strong's notebook.

Partial Key to Genera and Subgenera of Turridae
(All northern and deepwater shells omitted)

Anal sulcus very faint or absent
. Whorls angulated by a strong peripher cord or keel ....Kurtziella
. Whorls not angulated
... Aperture longer than the spire ....Mitramorpha
... Aperture not as long as the spire
.... Shell slender .... Mangelia
.... Shell stout .... Ishnula
Anal sulcus distinct
. Posterior angle of aperture thin edged, without armor
.. Anal sulcus at or near the suture
... Anal sulcus shallow, rounded
.... Aperture narrowing anteriorly to a short canal ..... Knefastia
.... Aperture widening anteriorly, without canal .... Daphnella
... Anal sulcus deep
.... Periphery of whorls frilled .... Ancistrosyrinx
.... Periphery of whorls not frilled ....Fusiturricula
.. Anal sulcus some distance below the suture
... Anal sulcus deep, on a spiral rib .... Polystira
... Anal sulcus shallow, triangular
.... A sculptured band between fasciole and suture ....Pseudomelatoma
.... A smooth band between fasciole and suture ....Moniliopsis
. Posterior angle of aperture thickened or armored
.. Anal fasciole present
... Interior of outer lip smooth
.... Inner lip smooth, more or less erased
..... Outer lip varicose
...... Varix extending around the sulcus to the suture.... Agathotomia
...... Varix not reaching the suture ....? Ithyeythara
..... Outer lip not varicose, anal sulcus projecting .... Nannodiella
.... Inner lip ending posteriorly in a callus pile
..... Outer lip not varicose
...... Anal fasciole adjoining the suture
.... Spiral sculpture fine or absent, axial ribs strong

(con.)

.... Interspaces between ribs smooth .... Cymatosyrinx
.... Interspaces spirally striate
.... Back of last whorl swollen, without ribs
.... Shell large, over 25 mm. in length .... Elaeocyma
.... Shell small, less than 20,, in length .... Syntomodrillia
.... Axial ribs extending over the back of the whorls. Clathrodrillia
.... Incised spiral lines cutting the ribs .... Kylax
.... Spiral keels riding over the weak axial ribs ...Carinodrillia
...... Anal fasciole separated from the suture by a sculptured band
.... Axial ribs strong, extending from fasciole to canal
.... Spiral sculpture of fine striae in interspaces.. Crassispira
.... Spiral cords distinct, riding over the ribs
.... Whorls shouldered ....Brachytoma
.... Whorls not shouldered ....Crassispirella
.... Axial sculpture weak or absent, spiral cords strong. Monilispira
..... Outer lip varicose, the edge thin .... Lioglyphostoma
..... Outer lip internally dentate
...... Canal very short,, ill defined .... Clathurella
...... Canal distinct, slightly curved backwards ....Glyphostoma
.... Anal fasciole absent
..... Inner and outer lip smooth .... Brophodrillia
..... Inner and outer lip dentate or lirate .... Zetekia

Key to Genera and Subgenera of Turridae as Defined by Grant and Gale

Notch armored, with a callus pile at the top of the inner lip
. Outer lip thickened and dentate in the adult .... Clathurella
. Outer lip without denticles
.. Notch indistinct ....Bellaspira
.. Notch deep, rounded .... Clavus
... Whorls with a conspicuous subsutural band ....(Crassispira)
... Whorls without a subsutural band
.... Sculpture confined to a spiral row of nodes .... (Clavus s.s.)
.... Axial sculpture of elongated nodes or ribs
..... Spiral sculpture of strong cords ....(Clathrodrillia)
...... Shell with a high spire and short canal .... (Cymatosyrinx)
...... Shell with a shorter spire and moderate canal
......Spiral sculpture of very fine lirae or none
.... Axial ribs ten or more ....(Brachytoma)
.... Axial ribs less than ten, very coarse ....(Drillia)
Notch unarmored
. Notch on a peripheral angle or cord
.. Sculpture of incised spiral lines and lines of growth only-Moniliopsis
.. Sculpture of spiral cords and lines of growth
... Canal moderate to long ....Turris
.... Anal fasciole smooth ....(Turris s.s.)
.... Anal fasciole beaded ....(Gemmula)
... Canal short but well defined (deep water) ....Pleurotomoides
... Canal ill-defined .... Taranis
. Notch separated from the suture by a sculptured band
.. Canal parallel sided, produced .... Turricula
... Shell elongate, large ....(Turricula s.s.)
... Shell fusiform, canal long .... (Pleurofusia)
.. Canal short or indistinct

(con.)

... Notch moderately deep, rounded .... *Clavatula*
.... Subsutural band coarsely sculptured .... (*Clavatula* s.s.)
.... Subsutural band moderately sculptured .... (*Knestia*)
.... Subsutural band rather inconspicuous .... (*Trchhylochetus*)
... Notch shallow, triangular .... *Pseudomelatoma*
.... Entire spire sculptured ....(*Pseudomelatoma* s.s. .)
.... Sculpture on tip of spire only ....(*Laevitectum*)
. Notch at or near the suture, without sutural band
.. Sculpture of rounded nodes or faint or wanting
... Aperture and canal about ½ length of shell ....*Surculites*
.... Whorls sharply angulated, tabulate .... (*Surculites* s.s.)
.... Whorls rounded or slightly turrited .... (*Megasurcula*)
... Aperture and canal about one third length of shell ...*Spirotropis*
.... Whorls sculptured with nodes on angulated shoulder..(*Typhomangilia*)
.... Whorls smooth except for lines of growth
..... Whorls rounded, often sinistral .... (*Antiplanes*)
..... Whorls angulated at the shoulder
...... Columella gentle flexuous, without plaits ....(*Spirotropis* s.s.)
...... Columella nearly straight, often plicate ....(*Borsonella*)
.. Sculpture distinct
... Shell medium to large, canal distinct
.... Periphery angulated, a nodose keel on the angle ....*Ancistrosyrinx*
.... Whorls shouldered or keeled (abyssal) .... *Leucosyrinx*
..... Axial sculpture present ....(*Surculina*)
..... Axial sculpture absent
...... Shoulder of whorls nodose ....(*Leucosyrinx* s.s.)
...... Shoulder of whorls not nodose
.... Spiral sculpture of strong cords .... (*Steiraxis*)
.... Spiral sculpture of fine striae
.... Notch near the suture ....(*Aforia*)
.... Notch remote from the suture ....(*Suavodrillia*)
... Shell medium to small, canal short or ill defined
.... Axial sculpture of lines of growth only, spiral cords..*Teres*
.... Axial sculpture of raised striae or ribs
..... Axial and spiral sculpture of fine, equal striae ...*Daphnella*
..... Axial sculpture of elongated nodes or ribs
...... Notch deep and rounded
.... Canal short, curved, notched behind (abyssal)...*Pleurotomoides*
.... Canal short, straight, not notched (abyssal)... *Borsonia*
...... Notch a narrow slit, or shallow or obsolete
.... Northern, or cold water species .... *Lora*
.... Southern or temperate and warm water species .... *Mangelia*
.... Notch obsolete at all stages, shell biconic .... (*Mitromorpha*)
........Notch shallow, rounded in the adult
.... Axial ribs few, distant ....(*Mangelia* s.s.)
.... Axial ribs closer, more irregular .... (*Bela*)
.... Notch deep, slit-like
.... Axial ribs wave-like, spirally grooved .... (*Agathotoma*)
..........Sculpture of axial ribs and spiral cords ...... (*Zetekia*)

Genus Megasurcula Casey,1904 (p. 147). Type (s.d. Grant and Gale,1931, p. 495): Pleurotoma (Surcula) carpenteriana Gabb. Pliocene-Recent.

Dr. Dall in Bull. 112 used the generic name Cryptoconus von Koenen,1867 (p. 211). Type (s.d. Cossmann,1889, p. 235): Pleurotoma filosa Lamarck.Eocene

Other authors have more recently been using the name Surculites Conrad,1865 (p. 213): Type (monotypy): Surcula annosa Conrad. Eocene, New Jersey. Doubtfully Turrid according to Wrigley,1939.

A synonymy of the various names applied to this group by different authors would be rather extensive.

Mr. A.M. Strong comments: " Megasurcula seems to be a good genus but restricted to our shells. They are so variable that I do not see how they can be divided into separate species or even varieties."

Dr. Joshua L. Baily Jr. comments " You are quite right in using this name, but I do not think it should be made a genus. I shall continue to use Surculites until someone convinces me that this is undesirable. I agree with you in making many species of this group subspecies of carpenteriana."

Megasurcula carpenteriana (Gabb),1865. Bodega Bay to Cerros Island, Mexico. Type locality: " not specified- advice of Dr. Keen).

A number of subspecies have been described almost entirely based on a difference in the nodulations. It is my opinion that we have but two distinct species on this coast, and that these nodulations will intergrade right down to the smooth form of carpenteriana in a large series. I think that I can show this in my collection after having collected them by the thousands. " (Burch). The above comment was approved by Mr. E.P. Chace and other members.

Collecting data: Dredged in from 15 to 50 fms. off Redondo Beach,Santa Monica, San Pedro, and down to Todos Santos Bay. Seems to be in greatest numbers around 30 fms. Prefers mud bottom. Will commonly get in crab and lobster traps. (Burch); off Newport in 35 fms.; same from Drake's Bay. (Lowe); Lower Calif. (Capt. Porter);

Megasurcula carpenteriana tryoniana (Gabb),1866. Santa Monica Bay to San Martin Island. Type locality: Post-Pliocene of San Pedro. The majority are disposed to simply place all of these subspecies in the synonymy of the typical. However, we will give the names, collecting records and range for the convenience of those who disagree.

Collecting data: San Pedro from fishermen's nets; off Newport in 35 fms.; (Lowe); Lower Calif. (Capt. Porter).

Megasurcula carpenteriana tremperiana (Dall),1911. Point Ano Nuevo,Calif. to Cerros Island. Type locality: off San Pedro.

Collecting data: off Newport in 35 fms. from halibut nets (Lowe);

Megasurcula carpenteriana granti Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57, pp. 60-61. Range: Monterey to San Pedro, Calif. Type locality:Monterey Bay.

Dr. Bartsch described this species as a distinct species on the difference in nodulations, for this reason alone distinguishing it from M. carpenteriana, M. c. tremperiana etc. We commented on these above. The original description, however, follows:

In the synonymy Dr. Bartsch places : Pleurotoma (Genota) carpenteriana Raymond, Nautilus, vol. 20, pl.2, fig. 3.

" Shell very large, spindle shaped, of dingy yellowish ground color with the spiral bands on the last whorl chestnut brown. Nuclear whorls about 2, small, well rounded, smooth. The early postnuclear whorls show the sinal depression. Beginning with about the third postnuclear whorl, the weak nodules at the anterior termination of the sinal area make their appearance. These extend over about 1.5 whorls, about 14 being present. On the succeeding turns the nodulations disappear. The sinal area on the last whorl is concave and the rest of the whorl, base and columella are convex. The outline of the base and columella on the left side is concave. The last two whorls are marked by very fine spiral lirations on the sinal area and little coarser threads anterior to this which gradually become stronger on the base. Here the moderately strong spiral threads are separated by three or four more slender threads, the heavier ones corresponding to the dark lines. The axial sculpture consists of rather rough incremental lines. There is a strong basal fasciole, which is marked by more or less concentric rough rugations. Aperture large, oval. Posterior sinus, of the outer lip broad and shallow. Anterior to the posterior sinus the outer lip is protracted. The inner lip shows decided resorpstion on the columella which also extends up on the parietal wall."

" This species belongs to the nodulose group of Megasurcula, i. e. M. tryonianus Gabb, M. cooperi Arnold, M. keepi Arnold, and M. tremperiana Dall. It differs from the last three in having the nodulations pronounced only on the early postnuclear whorls and absent on the last, and from tremperiana by its much larger size. "

Megasurcula remondii (Gabb),1866. Geol. Survery of Calif. , Palaeo., vol.2, p. 3, pl. 1, fig.5, 1866. In the synonymy: Pleurotoma (Genota) stearnsiana Raymond, Nautilus, vol. 18, p. 1, 1904; vol. 20, p. 38, pl.2, figs. 4,5,6.1906.

Grant and Gale, 1931, pp. 495-497 make an excellent case for Gabb's species.

Range: Monterey, Calif. to Todos Santos Bay (Burch). Type locality: Pliocene, Tomales Bay.

Collecting data: Our experience has been to find this a distinct form easily distinguished from the forms of carpenteriana. It is much less common and it is interesting that we have always taken it from gravel bottom while the above species seems to prefer mud or very fine sand. (Burch); off Redondo Beach in 25 fms.; off Santa Mojica in 20 fms.; off Rocky Point in 40 fms/; off Ensenada, L.C. in 50 fms. (Burch); off Catalina in 30 fms. (Lowe); XXXX San Diego Bay- dredged (Gripp).

Genus Aforia Dall,1889. Bull. Mus. Comp. Zool. 18:99,1889. Type (o.d.): Pleurotoma circinata Dall,1873.= insignis Jeff. Figured in Bull. 112.

Grant and Gale considered this a subgenus of Leucosyrinx Dall,1889. However, this does not seem to have been generally accepted. Dr. Bartsch published a paper on the species of the west Pacific- reference above.

" This group has the shell of a typical Pleurotoma , but has no operculum; the typical species reaches three or four inches in length, is strongly carinated above the periphery, and the wide rather deep anal sulcus is nearer to the carina than to the suture." (Dall).

Aforia circinata Dall,1873. Bering Sea (lat. 62 29') to Fuca Strait. Type locality: Nateekin Bay, Captain's Bay, Unalaska. Izhut Bay,Alaska(Eyerdam).

Genus Leucosyrinx Dall,1889.(p. 75). Type (o.d.): Pl. verrilli Dall. Recent, North Carolina to Gulf of Mexico 150-860 fathoms.

" Shell moderately large, thin, white or pale, with impervious axis, the sculpture chiefly of delicate spiral threading with feeble axial riblets at the shoulder; anal fasciole wide, shallow, next the suture; canal moderately long, distally flaring; th pillar thick, anteriorly obliquely truncate; operculum subovate, acute in front, with a medial thickened rib on the inner face, the area of attachment small, the nucleus apical." (Dall).

Leucosyrinx kincaidi Dall,1919. Shelikoff Straits, Alaska.
Leucosyrinx amycus Dall,1919. Off Monterey in 871 fms.
Leucosyrinx persimilis Dall,1889. Cortez Bank to Magellan Strait.

Dr. A.M. Keen advises on this species: " L. persimilis was described in 1889. No type locality was selected; localities in Chile and Ecuador were cited." Proc. U.S.N.M. 1889, p. 301, pl.6, fig.3.

Dall gives the range as : Abyssal, Eastern Pacific.

Leucosyrinx persimilis blanca Dall,1919. Off Cape Blanco, Oregon in 1064 fms.
Leucosyrinx persimilis leonis Dall,1908. Off Sealion Rock, Wash. to Cortez Bank, Calif. in deep water. Type locality: Off the coast of Washington in 877 f.

Genus Irenosyrinx Dall,1908. (p. 257). Type (o.d.): Pl. (Leucosyrinx) goodei Dall. . Grant and Gale,1931, p. 508 make a very good case for their contention that this genus should be placed in the synonymy of Aforia.

" Shell large, thin, fusiform, white, with a keel at the shoulder; sculpture feeble, wholly spiral; anal sulcus wide, shallow, nearer the shoulder than the suture ; axis pervious, aperture and canal longer than the spire; outer lip produced, thin, simple; canal elongate, pillar obliquely truncate; operculum in the young paucispiral. later the paucispiral nucleus is surrounded by concentric additions, leaving the nucleus subcentral, or a little anterior to the right, in an elliptical concentric operculum without internal rib, with a large area of adhesion, and an outline in general like the operculum of Buccinum " (Dall).

Irenosyrinx crebristriata(Dall)1908. Southwest of Sitka, Alaska in 1569 fms.

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Genus Morrisonella Bartsch,1945. Family: Buccinidae. Type: (o.d.), Leucosyrinx pacifica Dall,1908. Albatross Sta. 2859 in 1569 fms. on ooze bottom southwest of Sitka, Alaska.

Described by Dr. Paul Bartsch in Nautilus 59:23, pl.3, figs. 11-14,July, 1945. " The animal of the holotype is without eyes,and is a male and shows a huge verge (fig.14). The radula consists of 3-cusped rachidian teeth (fig.) 12 and 2- cusped marginal teeth (fig.13)."

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Genus Elaeocyma Dall,1918. Type (o.d.): Drillia empyrosia Dall. Recent, southern California. Proc. U.S.N.M. no. 2238, vol.54,p. 317,1918.

" The light colored species, with an oily gloss, thin shells, and prominent riblets usually crossed by rather widely spaced spiral striations will take the new name of Elaeocyma Dall. This group appears to be peculiar to the Pacific coast of America."

Our west coast species in this genus have been rather generally called Cymatosyrinx Dall,1889 (p. 95). Type (o.d.): Pleurotoma lunata Lea. Miocene, Virginia. Figured by Grant and Gale,1931, pl.26, fig.7. This was used by Dr. Dall in Bull. 112, with Elaeocyma as a subgenus.

Grant and Gale were disposed to use the genus Clavus Montfort,1810 (p. 434). Type (o.d.): C. flammulatus Montfort. Recent, West Africa. They then considered Cymatosyrinx a subgenus of Clavus.

Mr. A.M. Strong comments on this problem as follows: " I consider Cymatosyrinx a good genus, but do not think it contains any species from San Diego or north. Clavus might be used as a subfamily. The typical genus s.s can hardly be used for any west coast species. Elaeocyma Dall is a good

(con.)

genus with but the one species from California. The genus Imaclava Bartsch is very similar if not identical. Hemphilli Stearns and halocydne Dall are the northern representatives of a large southern group. They probably belong in a subgenus under Elaeocyma , but I can find no name for it. They are much smaller and more slender than the typical form."

Dr. Dall in Bull. 112 listed a species Cymatosyrinx johnsoni Arnold,1903 described from the San Pedro Pleistocene. I have been unable to locate any Recent records of this species and am therefore proposing to drop it from our faunal list.

Elaeocyma empyrosia(Dall)1899. Off Redondo Beach (Burch) to Todos Santos Bay (Burch). Type locality: off San Pedro in deep water.

Collecting data: Dredged off Redondo Beach in 25-50 fms.; off Avalon Catalina Island in 25 fms.; off Todos Santos Islands in 50 fms. (Burch); off Catalina Island in 30 and 50 fms. (Lowe).

Elaeocyma hemphilli(Stearns),1871. Santa Barbara to Gulf of California. Type locality: Todos Santos Bay.

Collecting data: We dredged a number of specimens apparently of this species off Redondo Beach and Malaga Cove. Mr. George Willett classified them as hemphilli var. aeolia Dall. However, aeolia is a southern form and I hesitate to add it to our list without further checking. Furthermore I note that Mr. A.M. Strong considers aeolia a distinct species from the Gulf and Tres Marias Islands. Dall described it as Elaeocyma aeolia in Proc. U.S.N.M., no. 2288, vol. 56, p. 11, pl.3, fig.1.(Burch); typical specimens dredged in great abundance at the type locality in Todos Santos Bay in approximately 10-15 fms,; also taken littoral at low tide from the sand bars in the Estero below Ensenada; off Santa Monica, Calif. in 15 fms. (Burch); San Diego in 10 fms. (Kelsey); San Pedro in 10 fms.; Estero de Todos Santos Bay (Lowe); Scammon's Lagoon (Hemphill).

Elaeocyma halocydne Dall,1919. San Pedro and the Santa Barbara Islands (Dall). Also off Redondo Beach (Burch). Type locality: off San Pedro.

Collecting data: off Redondo Beach in 25 fms. gravel bottom; off Ensenado, Mexico in 50 fms. (Burch); San Pedro in 30 fms.; Catalina in 25 fms.; (lowe).

Genus Clathrodrillia Dall,1918 (p. 317). Type (o.d.): Pleurotoma gibbosa Reeve= P. gibbosa Kiener. Recent, Indian Ocean.

" For the generally brown or brownish clathrate species, a few of which are found in nearly every fauna, and of which Pleurotoma gibbosa Reeve may be specified as a typical example, the new name Clathrodrillia Dall may be used." (Dall). Grant and Gale, 1931, p. 579 considered this a subgenus of Clavus distinguishing it as follows: " Shell like that of the typical subgenus but sculptured with axial ribs instead of nodes and with prominent spiral cords overriding the ribs."

Mr. A.M. Strong comments: " I do not think Clathrodrillia is represented north of San Diego. C. renaudi Arnold does not seem to have been reported by any one as living except by Dall." Rept. S. end San Clemente 40 fms.(Baker)

Clathrodrillia renaudi Arnold,1903. San Pedro, Calif. Also Pleistocene.

Genus Suavodrillia Dall,1918. Type (o.d.): Drillia kennicottii Dall. Recent, Alaska.

" Shell like that of Aforia, with a somewhat angular notch remote from the suture, but with a shorter anterior canal" (Grant & Gale,1931, p.509.

(con.)

Grant and Gale, 1931 p 509 considered this a subgenus of Leucosyrinx. However, the majority of recent writers have been giving it generic standing.

Suavodrillia kennicottii Dall,1871. Bering Strait south to the Aleutian Islands. Type locality: North Harbor, Unga Island.
Suavodrillia willetti Dall,1919. Forrester Island, Alaska.

Genus Ophiodermella Bartsch,1944. Proc. Biol. Soc. Wash., vol.57, p 61-62 Type (o.d.): Ophiodermella ophioderma (Dall)- Pleurotoma ophioderma = Pleurotoma inermis Hinds 1844 not Bartsch 1843.

Dr. Dall placed these species under Clathrodrillia and subgenus Moniliopsis. Other authors such as Grant and Gale,1931 have been using as genus Moniliopsis Conrad,1865 (p. 143) . Type (monotypy), Pleurotoma elaborata Conrad. (Claibornian) Middle Eocene, Alabama. Dr. Joshua L. Baily Jr. comments on this: " Moniliopsis Conrad cannot be a subgenus of Clathrodrillia as Dall made it in Bull. 112 because it is the older name. If the two are closely related, Clathrodrillia must be the subgenus."

Mr. A.M. Strong comments as follows: " Ophiodermella is probably a good genus. O. fancherae is figured as a young specimen of O. halcyonis Dall but has priority. O. rhines Dall is a new name for O. cancellata Carp."

Description of Ophiodermella Bartsch follows:

" Shell rather large, regularly conic, with the first 2 nuclear whorls smooth and well rounded. The succeeding turns gradually develop the postnuclear sculpture. The postnuclear whorls bear axial riblets which assume a sigmoid trend (these vary materially in strength in the different species). In addition to this axial sculpture numerous fine incremental lines are present. The spiral sculpture consists of low cords and fine spiral striations. The base is usually marked with a little more intense sculpture, while on the columella it again becomes decidedly enfeebled. The columella bears a weak basal fasciole. The aperture is moderately long and moderately broad. The posterior sinus is moderately deeply incised, the deepest portion falling a little posterior to the middle of the turns. Anterior canal moderately long. The inner lip is sigmoid. The operculum is quite small, ovate, with apical nucleus and concentric lines of growth. The radula bears marginal teeth only which resemble a long slender curved awl."

" While superficially the species in the new genus resemble Moniliopsis other structures point to a wide separation. Moniliopsis has three smooth nuclear turns followed by axially ribbed stage which in turn is succeeded by the postnuclear sculpture. Also, the columella of Moniliopsis is straight, not sigmoid as in the present genus. These are good and sufficient characters for separation."

Ophiodermella montereyensis Bartsch,1944. Proc. Biol Soc. Wash. vol. 57, p 62 Type locality: Monterey Bay at Sta. 3138, Albatross in 19 fms.

The original description follows: " Shell small, elongate-turrited, reddish horn colored with the inside of the ourter lip a little paler. The nucleus consists os 2 small smooth turns which pass into the postnuclear sculpture. The postnuclear whorls are moderately rounded and marked by sigmoid axial ribs which are not quite as wide as the spaces that separate them, and the spiral threads about as wide as the axial ribs. The combination of these two elements lends to the whorls a somewhat fenestrated appearance . Periphery slightly angulated. Base moderately well rounded and marked like the spire. The columella is rather slender, sigmoid and marked by spiral cordswhich are more distantly spaced than those pn the spire and base. Aperture elongate pear-shaped with the deepest incision of the moderately profound

(con.)

posterior sinus about two thirds of the distance between the summit and the suture, anterior to the summit. Anterior to the posterior sinus the outer lip is protracted. The inner lip is sinuous and bears a shining resorption area on the columella, which also extends over the parietal wall."

" In its type of sculpture the species most nearly resembles O. halcyonis but it differs from that in having much more numerous axial riblets and in being smaller."

? Ophiodermella grippi (Dall),1919. Malaga Cove (Burch) to San Diego. Type locality: San Diego.

Collecting data: This species probably does not belong in this genus but Dr. Dall had it grouped here. It seems quite different from the other species involved. Grant and Gale comment on it as follows " This species is very interesting because it bridges the gap between Moniliopsis and Pseudo-melatoma. The strength of the spiral sculpture and the more delicate con-struction of the shell place it here rather than in Pseudomelatoma." When we first collected this species from holdfasts of kelp in Santa Monica Bay it was a puzzle for all of us until Dr. A. Myra Keen compared the specimens with the type in Washington, D.C. Mr. and Mrs. E.P. Chace and Mr. and Mrs. Ralph Bormann have collected a number of specimens at White's Point, San Pedro.

This species should not be confused with the species listed in Bull. 112 as Lora grippi which is a very different thing.

Other collecting records are Point Vincent (Lowe); Imperial Beach from kelp holdfasts (Randall);

Ophiodermella incisa(Carpenter)1864. Puget Sound to San Pedro, Calif.

Dr. A. Myra Keen advises on this species: " The type locality of O. incisa is Neah Bay, according to the holotype label in the USNM. It is sometimes stated to be a homonym, but if so it is a secondary one. The name effusa Carpenter is available if ever needed."

Collecting data: De Poe Bay, Oregon; Crescent City, Calif.; dredged off Monterey in 20 fms. shale (Burch); Port Orchard, Wash. (Lowe).

Ophiodermella ophioderma (Dall),1908. Baulinas Bay, Calif. to Ballenas Lagoon, L.C. New name for Drillia inermis Hinds. Type Loc.: Magdalena Bay.

Collecting data: Our experience has been to find this a not uncommon littoral species from Monterey to Todos Santos Bay.; dredged in shallow water 10 fms. off Santa Monica, Redondo Beach in 15-25 fms.; off Ensenada in 15 fms.; littoral on sand bars at Anaheim Landing, common; (Burch); San Pedro in 10 fms.; San Diego Bay: Alamitos Bay (Lowe).

Ophiodermella rhines (Dall), 1908. New name for O. cancellata Carpenter. British Columbia to San Diego, Calif. Type locality: Puget Sound.

Collecting data: dredged in Puget Sound off San Juan Islands (T. Kincaid) (Burch); Departure Bay, B.C. in 25 fms.; off San Juan Islands in 25 f. (Lowe).

Ophiodermella fancherae (Dall),1903. (In syn. O. halcyonis (Dall),1908.)

Burrard Inlet south to Point Abreojos, L.C. Type locality: near Avalon, Catalina Island. Type Loc. of halcyonis: off Coronado Beach,San Diego, Calif.

Collecting data: Dredged off Redondo Beach in 25 fms.; off Avalon, Cat-alina Island in 25 fms.; off Ensenada, Mexico in 25 fms.; (Burch); San Pedro in 8 fms.; Catalina Island in 30 fms. (Lowe).

Genus Burchia Bartsch,1944. Nautilus 57:115.

" Shell large, turrited, covered by a strong periostracum. Nuclear whorls small (badly eroded in all our specimens). Postnuclear whorls with a concave sinal area which extends over the posterior third of the turns.

(con.)

The anterior two-thirds are convex and crossed by strong, low, broad, retractively slanting axial ribs which evanesce on the base. The sinal area shows a few incised spiral lines, while the entire rest of the surface bears feeble rather distinctly spaced spiral threads which become intensified on the base of the columella. Suture well impressed. Base moderately rounded. Columella short and stout. The aperture is ovate. The outer lip with a deep posterior V-shaped sinus below the summit; anterior canal rather broad; inner lip reflected over the columella and parietal wall as a heavy calluswhich may be somewhat thickened at the posterior angle of the aperture. Operculum small, oval, with a low ridge on the right side and apical nucleus, marked on the outside by concentric lines of growth. Radula with Y-shaped marginals only."

Type: Burchia redondoensis (Burch). (= *Pseudomelatoma semiinflata redondoensis* Burch).

Burchia redondoensis (Burch),1938. Off Redondo Beach to Newport Bay. Type locality: off Redondo Beach in 25 fms. Nautilus 52:21,22, text f. 2.

The description follows: " Shell brown under a black periostracum. Longitudinal sculpture consisting of 14 low, slightly oblique ribs, weaker than on typical *semiinflata* and evanescing below the periphery of the penultimate whorl. Whorls of spire subangular just anterior to the suture. Spiral sculpture more prominent on the base than on spire and consisting of slightly raised lirae. Dimensions: alt. 45 mm; length of aperture, 18 mm.; diameter of body whorl, 12 mm. "

Genus Pseudomelatoma Dall,1918. (p. 317). Type (o.d.): *Pleurotoma penicillata* Carpenter.

" Shell fusiform, spire longer than the aperture, whorls longitudinally ribbed or nodulous, aperture oblong-ovate; sinus shallow, outer lip thin, inner lip with thin coating of enamel; canal short and nearly straight. Differs from *Clathrodrillia* in stronger sculpture and less prominent sinus" (Oldroyd).

Mr. A.M. Strong comments on this genus: " *Pseudomelatoma* seems to be a good genus. The species names have been used by different people for different shells and the locality records all depend on the person who identified them. I think *P. torosa* Carp. should be confined to the Monterey area, *P. moesta* Carp. and the worthless variety or color form *aurantia* to southern California and the northern part of Lower California while *P. penicillata* Carpenter is to be found from Cerros Island and south to Cape San Lucas."

Pseudomelatoma moesta (Carpenter),1864. Monterey, Calif. to Cerros Island, L.C. (Dall). Type locality: Santa Barbara, Calif.

It is very doubtful if this species is found in the Monterey area.

Collecting data: San Pedro, Pt. Firmin, White's Pt.; Bird Rock, San Diego; Palos Verdes; Pt. Vicente:Dana Pt., Orange Co.; Punta Banda, L.C.; many shore localities, very abundant at San Onofre (Burch); San Pedro (Lowe).

Pseudomelatoma torosa (Carpenter),1864. Monterey, Calif. south to San Ignacio Lagoon, L.C. (E. Jordan). Type locality: Monterey, and north.

As stated above we think this species is confined to the Monterey area.

Collecting data: De Poe Bay, Oregon; Crescent City, Calif.; dredged off Monterey in 10-40 fms. (Burch); Monterey and Cayucos (Lowe).

Pseudomelatoma torosa aurantia (Carpenter),1864. Dr. A.M. Keen advises thsat the type locality is San Pedro to San Diego. However, it seems obvious that this is a color form of *moesta* and certainly not of *torosa*. (Burch).

Genus Crassispira Swainson,1840. Type (s.d. Hermannsen,1847, p. 313): Pleurotoma bottae Valenciennes (in Kiener 1839-40).

" Shell somewhat claviform, tuberculated; scarcely any anterior canal; internal lip with a thick posterior callus; external lip thick within."(Tryon).

Dr. Dall and others have placed our species montereyensis Stearns in this genus. Grant and Gale consider it a subgenus of Clavus.

Bartsch and Rehder described a new subgenus in 1939 which seems to have been rather generally raised to generic standing and our species should be placed in it according to Mr. A.M. Strong. Crassispirella.

Genus Crassispirella Bartsch and Rehder,1939. (p. 135). Type (o.d.), Turris rugitecta Dall. Recent, Lower Calif. Figd. Dall,1919 (pl.7,f. 6) Proc. of USNM, vol. 87, no. 3070, p. 135, 1939.

Crassispirella montereyensis (Stearns),1871. Monterey, Calif. to Mazatlan.

Genus Pleurotomoides Bronn.,1831.(p. 47). Nom. nov. for Defrancia Millett,1827, non Defrancia Bronn. 1825. See Iredale 1917, p. 326, and Woodring 1928, p. 187. Type (s.d. Dall,1908, p. 260): Defrancia pagoda Millett. Miocene, Italy.

Bartsch,1941, Proc. Biol. Soc. Wash., vol. 54, p. 2 discusses this matter with the above conclusion.

Dr. Dall used Cryptogemma Dall,1918 (p. 318). Type (o.d.): Gemmula benthina Dall,1908. Gulf of Panama to Ecuador in 812-1360 fms. Proposed as a subgenus of Gemmula. This is a synonym of Hemipleurotoma according to Grant and Gale.

Dr. A. Myra Keen comments:" According to Bartsch,1941 (and I think he is right), Pleurotomoides is a substitute for Defrancia and automatically takes the same type."

Grant and Gale figure Hemipleurotoma cossmann,1899 (pl. 26, f.36). Type (o.d.): Pleurotoma archimedis Bellardi. (Helvetian) Middle Eocene, Italy.

However, Dr. Bartsch has described a new genus Carinoturris designating one of these species a genotype and describing another species. Dr. Bartsch , however, advises (Per. Comm. May,1946) regarding the group of species listed by Dall under Cryptogemma " This is a mixture of a number of things which my MS straightens out."

? Pleurotomoides pernodata (Dall),1908. Tillamook, Oregon to Tehuantepec in deep water. Type locality: Albatross station 3414, southwest of Tehuantepec in the Pacific in 2,232 fathoms.

? Pleurotomoides calypso (Dall),1919. Off San Diego, Calif. in 822 fms.

? Pleurotomoides herilda (Dall),1908. Santa Barbara, Calif. to Panama in deep water. Type locality: Albatross station 3360, Gulf of Panama in 1,672 fathoms.

? Pleurotomoides cymothoe (Dall), 1919. Santa Barbara Islands to San Diego, Calif. in deep water. Type locality: off San Diego, Calif. in 822 f.

? Pleurotomoides polycaste (Dall),1919. Off Tillamook, Ore. in 786 fms. to Gulf of Calif. Type locality: off Tillamook, Ore. in 786 fms.

Pleurotomoides chrysothemis (Dall),1919. Between Santa Catalina and San Clemente Islands in 704 fathoms and off North Coronado Island, in 656 fms. Type locality: between Catalina and San Clemente Islands.

Pleurotomoides eidola (Dall),1919. Off San Diego, Calif. in 312 to 822 fms.

Pleurotomoides oregonensis (Dall),1919. Off Tillamook, Ore. in 786 fms.

Genus Carinoturris Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p.60. Type (o.d.): Carinoturris adrastia (Dall) = Cryptogemma adrastia Dall.

Carinoturris adrastia (Dall),1908. Monterey to San Diego, Calif. in deep water. Type locality; Monterey Bay in 578 fathoms.
Carinoturris fortis Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 60. Type locality: Albatross Sta. 3187 off Point Sur, Calif. in 298 fathoms.

The original description follows: " Shell large, elongate-conic, covered with a grayish olivaceous periostracum. Nuclear whorls decollated. The postnuclear whorls have a weak median spiral cord. Anterior to this they curve convexly to the slightly shouldered summit. This area is marked by retractively curved incremental lines only. The anterior half of the last whorl and base are inflated, strongly rounded, and marked by strong incremental lines which vary in strength and almost give to the base an obscurely ribbed aspect. Columella rather stout, moderately long, twisted. The left outline of the base and columella is moderately concave. Aperture elongate pear-shaped with the anterior canal moderately long and rather broad. The posterior sinus is broad and extends from the summit to the median cord. Anterior to this the outer lip is protracted. The inner lip is obliquely truncated, free for about two-fifths of its basal length. The posterior portion appears on the columella as a smooth resorption area which also extends over the parietal wall."

" It is easily distinguished from C. adrastia Dall by having a much longer aperture and the spiral keel much less developed."

Genus Rectiplanes Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 59 Type (o.d.): Rectiplanes santarosana (Dall)= Pleurotoma (Antiplanes) santarosana Dall.

Inasmuchas santarosana is a dextral shell I suggested that perhaps Rectiplanes was described to include all of the dextral species grouped under Antiplanes by Dr. Dalland others. However, Dr. Bartsch advises me (Per. Comm. May,1946) " Largely, not all. Some belong to another subfamily." We will therefore simply list the one type species here and place all other species under Antiplanes until further notice.

Rectiplanes santarosana (Dall),1902. Point Sur to San Diego. Type locality: off Santa Rosa Island in 53 fathoms. Bull. 112,pl.1,f.9

Collecting data: Dredged off Redondo Beach in 75 fathoms mud bottom (Burch); off the south end of San Clemente Island in 40 fms. (Dr. Baker).

Genus Antiplanes Dall,1902 (p. 513). Type (o.d.): Surcula perversa Gabb. Post-Pliocene to Recent, California.

Grant and Gale used the name Spirotropis G.O. Sars,1878.(p. 242). Type (monotypy): S. carinata Philippi. Recent, Norway to Azores. They used Spirotropis for the entire group and placed Antiplanes as one of the subgenera. However, this does not seem to have been generally accepted.

Antiplanes abarbarea Dall,1919. Cape Martin to Cortez Bank, Calif.
Type locality: off Santa Rosa Island in 55 fathoms.
Antiplanes agamedea Dall,1919. Off Cape San Quintin in 359 fathoms.
Antiplanes amphitrite Dall,1919. Off Santa Barbara Island in 638 fathoms.
Antiplanes amphitrite beroe Dall,1919. Off San Diego,Calif. in 822 fathoms.
Antiplanes antigone Dall,1919. Off San Diego, Calif. in 822 fms.
Antiplanes amycus Dall,1919. Monterey Bay, in 581 fathoms.

(con.).

Antiplanes beringi Aurivillius,1885. Bering Sea south of St. Lawrence Island to the Laeutians and eastward to the Shumagin Islands.
Type locality: Dr. A.M. Keen advises " probably Lat. 60 39' N, Long. 177 5'W.
Antiplanes briseis Dall,1919. Drake's Bay to Coronado Islands.
Type locality: off Drake's Bay, Calif. in 30 fathoms.
Antiplanes bulimoides Dall,1919. Bowers Bank, Bering Sea.
Antiplanes catalinae Raymond,1904. Esteros Bay to San Diego.
Type locality: off Catalina Island in 125 fms.
Antiplanes diaulax Dall,1908. Off Coronado Islands.
Antiplanes diomedia Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p 58.
Albatross Sta. 3186 off Point Sur, Calif. in 328 fathoms.

The description follows: " Shell moderately large, turrited, sinistral, covered with a thin olivaceous periostracum. Nuclear whorls eroded. The postnuclear whorls are inflated, strongly inflated rounded, slopingly shouldered, and marked by rather strong sinuous incremental lines which follow the outline of the posterior sinus. In addition to this, they are marked by weak , oblique, dendritic markings. Suture very strongly constricted. Base of the lastwhorl moderately rounded, moderately long. The columella is rather stout, moderately long, somewhat twisted, and marked by the continuation of the incremental lines. Aperture short, very broad and large. Outer lip thin with a broadly incised posterior sinus anterior to which it is protracted. The inner lip is sinuous and reflected over the columella as a thick callus . The anterior canal is short and broad.

This somewhat resembles *Antiplanes profundicola* but is ever so much larger."

Antiplanes hyperia Dall,1919. Off Drake's Bay and the Coronado Islands.
Type locality: Off Drake's Bay, Calif. in 30 fathoms.
Antiplanes kamchatica Dall,1919. Southwestern Bering Sea in 48 to 100 fms. .
Antiplanes litus Dall,1919. Coast of Washington to Esteros Bay, Calif.
Type locality: off Esteros Bay, Calif. in 92 fathoms.

Collecting data: off Redondo Beach in 75-100 fathoms.

Antiplanes major Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 29,1944.
Type locality: Albatross Sta. 3172, off Bodega Head in 62 fms., lat. 38 23' 35" N, long. 123 14 ' W. on black sand bottom. The description follows: " Shell very large, elongate-turrited, covered by a reddish olivaceous thin periostracum. Interior of the aperture with a brownish flush which is intensified in a narrow band at the summit and another one at the insertion of the columella. In some specimens the entire aperture is brown. Nuclear whorls 2, small, smooth, forming a slightly expanded tip. The postnuclear whorls are slightly rounded, very narrowly shouldered at the summit and marked by rather strong incremental lines which are decidedly sigmoid and follow the outline of the posterior sinus. The channel and the region posterior to it are marked by inconspicuous, microscopic, spiral threads. In addition to this, fine oblique dendritic threads are present which radiate retractively from the median portion to the posterior sinus. Anterior to the posterior sinus the whorls are marked by strong spiral threads which vary in size and spacing. Base rather long, marked by incremental lines and spiral threads which are stronger than those on the anterior portion of the whorls. Columella rather long marked like the base. Aperture elongate tear-shaped with the anterior channel rather long and broad. The posterior sinus is deep and the outer lip is protracted anterior to it. The inner lip is sinuous and marked as a smooth resorption area."

" This species can readily be distinguished from all other California *Antiplanes* by its huge size."

Antiplanes perversa Gabb,1865. Forrester Island, Alaska to San Diego and Cortez Bank. Type locality: . Post Pliocene. Catalina Id. 60 fms.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. mud; off Avalon, Catalina Island in 50 fms. (Burch); San Diego (Kelsey); Catalina Island in 50 fms.; Santa Barbara channel in 200 fms.; San Diego in 150 fms. (Lowe); Victoria & Strair of Juan de Fuca (Eyerdam).

Antiplanes profundicola Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, pp. 57-58. Range: Off Point Sur Light to North Coronado Island in 656 fathoms. Type locality: Albatross Sta. 4352 off Point Loma Lighthouse, Calif. in 549 to 585 fathoms. The description follows.: " Shell ofm medium size, rather stout in comparison to its height, sinistral, covered with a thin olivaceous periostracum. Nuclear whorls eroded. The postnuclear whorls are inflated, strongly rounded, and marked by decidedly sigmoid incremental lines which follow the outline of the very deeply incised broad posterior sinus. In addition to this, the whorls are marked by slender, retractively curved, dendritic threads which radiate obliquely, retractively from the middle of the turns both anteriorly and posteriorly. The anterior half of the whorls also bears feebly incised spiral threads. Suture very strongly constricted. Base rather short, well rounded. Columella moderately long and stout. The base and columella are both marked by the continuations of the incremental lines and spiral threads, the latter become stronger on the columella. The right outline of the base and columella is decidedly concave. Aperture large. Anterior canal broad and short. Outer lip thin, protracted anterior to the sinus; inner lip decidedly sigmoid, reflected over and appressed to the base and columella." " The short stout form will readily distinguish this species from the other members of the region."

Antiplanes rotula Dall,1921. (smithi) Forrester Island, Alaska to San Diego, Calif. Type locality: San Pedro Pleistocene. Bull. 112

Collecting data: Dredged off Redondo Beach in 50 fathoms (Burch); off Catalina Island in 35 fms. (Lowe).

Antiplanes thalaea Dall, 1902. Unimak Pass, Aleutian Islands to San Diego, Calif. Type locality: off San Luis Obispo, Calif. in 252 fms.

Collecting data: Off Redondo Beach in 50 fms. (Burch); off Point Loma in 40 fms. (Kelsey and Baker); off Redondo Beach in 35 fms. (Tremper).

Dr. A. Myra Keen advises: " The figures of A. thalaea and santarosana were interchanged in Bull. 112 and copied by Mrs. Oldroyd. Correct references are: Bull. 112, pl. 1, fig.8; Oldroyd, vol. 2, pt. 1,, pl. 6, fig.1, for thalaea."

Antiplanes vinosa Dall,1874. Bering Sea to San Diego, Calif. Type locality: Kyska Harbor, Great Kyska Island, Alaska.

Genus Borsonella Dall, 1908 (p. 258). Type (o.d.): Borsonia dalli Arnold. Grant and Gale consider this a subgenus of Spirotropis. This has not been generally accepted.

Borsonella angelana Hanna,1924. New name for B. dalli Arnold,1903. Drake's Bay, Calif. to Coronado Islands. Type locality: Pleistocene of San Pedro, Deadman's Island.

Borsonella barbarensis Dall,1919. Off Santa Barbara Islands in 414 fathoms.

Borsonella bartschi Arnold,1903. Redondo Beach (Burch) to San Diego. Type locality: Lower San Pedro, Deadman's Island fossil.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. (Burch).

Borsonella civitella Dall,1919. Off Point Loma, Calif. in deep water.

Borsonella coronadoi Dall,1908. San Clemente Island, Calif. to the Coronado Islands. Type locality: off Los Coronado Islands.

[illegible] fathoms in deepwater. Type Loc.: off San Diego in [illegible] fms.
Borsonella nicoli Dall,1919. Off Point Loma, Calif. in deep water.
Borsonella omphale Dall,1919. Off Point Loma, Calif. in deepwater.
Borsonella pinosensis Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p.63. Off Point Pinos Lighthouse in 49-50 fathoms. The description follows:
" Shell rather large, elongate-turrited, covered with a pale olivaceous periostracum. Nuclear whorls decollated in all our specimens. The post-nuclear whorls are moderately well rounded, appressed at the summit with the posterior sinal area slightly impressed, extending from the summit to about two thirds of the distance between the summit and the periphery. The whorls are marked by irregularly developed, closely spaced incremental lines which assume almost the strength of riblets. In addition to this, feeble incised spiral lines are present which are best developed on the posterior half of the turns. There are also certain criss cross markings present. But well rounded and marked like the spire. Columella stout with a narrow umbil-ical chink at the posterior portion. The columella is marked by a contin-uation of the axial sculpture. Aperture elongate pear-shaped. The posterior sinus falls immediately below the summit and s broad and moderately deep. Anterior to the posterior sinus the outer lip is protracted into a claw-like element. The inner lip is thick and reflected over the columella and bears an obscure fold a little anterior to its insertion. The parietal wall is covered by a moderately thick callus.

This species seems to have been confused with Borsonella dalli Arnold from the Pleistocene of Deadman's Island, but the strong angulation of the whorls of dalli will readily distinguish it from the present species."
Borsonella nychia Dall,1919. Off Point Loma, Calif. in 101 fathoms.

Genus Rhodopetoma Bartsch, 1944. Proc. Biol. Soc. Wash., vol. 57, p. 59. Type (o.d.): Rhodopetoma rhodope (Dall) =Borsonella rhodope Dall.

Rhodopetoma rhodope Dall,1919. Off Santa Rosa Island in 82 fathoms and off San Diego in 633 fathoms. Type locality: off Santa Rosa Island.

Genus Lora Gistel,1848. (p.9). The status of this name is without a doubt so questionable as to assure its abandonment at least for our shells. Dr. Paul Bartsch, " The Nomenclatorial Status of Certain Northern Turritid Mollusks", Proc. Biol. Soc. Wash., vol. 54, pp. 1-14, Feb. 26,1941 gives us a discussion of the matter with the description of a number of new genera. In this paper we propose to allocate such species that have been mentioned to Dr. Bartsch's new genera or elsewhere as advised, and then simply list our collecting records for the remaining species under the name Lora with " Lora" indicating that it is understood that sooner or later the species will be placed elsewhere.

Grant and Gale attempted to make a case for Lora with type D. viridula Fabricius, but this has been generally rejected.

Dr. Joshua L. Baily Jr. comments: " Lora Gistel. This name I would abandon altogether in accordance with the decision of the A.M.U. Committee on Nomenclature.".

Mr. A.M. Strong comments: " I do not think that Bela, Lora or Mangilia can be used for any of our shells. Except where Bartsch has designated a genus, I think that the only thing we can do is to list the various species as " Mangilia" showing that we do not list them in any definite genus."

(con.).

Dr. A. Myra Keen comments: " Bartsch's 1941 paper cited above is our only modern clue to the nomenclature of " Lora" and its allies. Bartsch names a number of new genera and hints that other names are forthcoming. However, he lists several generic names and cites types that will cover at least a part of our species. I have taken the time to allocate only a few. Here they are, with locality ranges from our collections: "

Dr. L.G. Hertlein of the California Academy of Sciences has kindly sent us a list of the locality records of this group in their collection.

Genus Propebela Iredale,1918. (p. 32). Type (o.d.): Murex turricula Montagu. Recent, British Isles and Northern Europe. Figd. Forbes and Hanley 1851 (Pl. 111, figs. 7,8.).

Propebela nazanensis (Dall), 1919. Nazan Bay, Atka Island to Kodiak Island, Alaska. Type locality: Nazan Bay.

Collecting data: Kodiak Island (Stanford Coll.); Elrington Island, Pr. Wm. Sound, Alaska, 1924 (Eyerdam); Portage Bay, Alaska, midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna and E.W. Scott- Calif Acad. of Sci.);

Propebela nobilis (Muller), Arctic Ocean, Bering Sea, off Akutan Pass, in 60 fms. to Fort Vita, Raspberry Island, Alaska in 10-20 fms.,1945(Eyerdam) . Type locality: off Akutan Pass.

Propebela turricula (Montagu),1803. Icy Cape, Arctic Ocean to Puget Sound, Bristol Channel, western and eastern parts of England and Wales, on all the Irish, Scotch and Icelandic coasts. Type Loc.: Sandwich, Kent.

Collecting data: Puget Sound (Stanford Coll.); Izhut Bay, Afognak I., and Sawmill Bay, Pr. Wm. Sound, Alaska (Eyerdam); Portage Bay, Alaska, midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna and E.W. Scott- Calif. Acad. Sci.).

Subgenus Turritoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p.7. Type(o.d.): Propebela (Turritoma) exquisita Bartsch,1941. Recent,Japan.

Propebela diomedia Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57, p.66. Type locality: Monterey Bay, Albatross Sta. 3670 in 581 fms.

The description follows: " Shell small, thin, yellowish white. Nuclear whorls decollated. The postnuclear whorls are strongly rounded with a decided angulation at the anterior limit of the posterior sinus. The postnuclear whorls are marked by strong, protractively slanting axial ribs which are about half as wide as the spaces that separate them. Of these ribs, 18 are present on the last turn and 15 on the preceding whorl. The spiral sculpture consists of fine incised lines on the shoulder of the turns, that is the sinal area. The shoulder is marked by a spiral cord that renders the axial ribs very strongly nodulose. Anterior to the shoulder the whorls are marked by strong spiral cords of which 2 are present on the first remaining turn, 3 on the second and 4 on the third and last turn. Base strongly rounded and marked by the feeble continuations of the axial ribs and 8 spiral threads which become slightly weaker toward the columella. The columella is slender, slightly concave on the left side, and marked by 17 spiral threads. The aperture is pear shaped. The posterior sinus is moderately deep. Anterior to the posterior sinus the outer lip is protracted and slightly concave on the basal portion. The inner lip is appressed to the columella which it marks as a slight absorption area that extends over the parietal wall. It differs from P. (T.) monterealis Dall in being much shorter, stouter with more angul-

(con.)

-ated shoulder and in having more distantly spaced ribs."

Propebela monterealis Dall,1919. Monterey Bay, Calif. in 581 fathoms.

Propebela profundicola Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 67. The description follows: " Shell moderately large, elongate-ovate, yellowish white. Nuclear whorls decollated. The postnuclear whorls are well rounded and and bear a moderately strong angulation at the anterior termination of the posterior sinal area. The last postnuclear whorl bears 14 broad heavy axial ribs which are not quite as wide as the spaces that separate them. The preceding turn has 11 ribs. The spiral sculpture consists of 6 slender spiral threads in the sinal area, while the angulation a heavier cord is present which renders the axial ribs nodulose. The space between the angulation and the suture bears 5 low spiral cords between which finer spiral threads are present. The base is moderately long, well rounded, and marked by the continuation of the axial ribs and 15 spiral threads, between which and on which finer spiral striations are present. The columella is moderately long and marked by feeble spiral threads. Aperture pear-shaped. The posterior sinus extends fromthe summit to the angulation and is shallow. Anterior to the posterior sinus the outer lip is protracted. The inner lip is reflected over the columella as a smooth area which extends over the parietal wall.

This species is much larger than *Propebela (Turritoma) diomedea*, with the axial ribs coarser, heavier and even more distantly spaced, while the nodulation of the shoulders of the whorls is much less strong."

" The ttpe, U.S.N.M. No. 274112, was dredged by the U.S. Bureau of Fisheries steamer Albatross at station 4538 in 871 fms. on gray sand and rock bottom, off Point Pinos Light. It has 4 whorls remaining and measures Height, 13.3 mm.; greater diameter, 6.2 mm."

Propebela (Turritoma) smithi Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 67. Type locality: Albatross Sta. 4508 in 293-386 fms. off Point Pinos Light, on mud bottom. Type has 5 whorls and measures: Height, 9.5 mm; greater diameter, 4.3 mm. The description follows: " Shell moderately large, elongate-ovate, thin, yellowish white. Nuclear whorls decollated. The postnuclear whorls are well rounded. They are slightly channeled at the summit and roundly shouldered at the angulation, which is two-fifths of the distance between the summit and the suture, anterior to the summit. They are marked by slender, somewhat sinuous, protractively slanting, axial riblets which are best developed on the middle turns. On the last 1.5 turns they become gradually reduced and on the last portion of the last turn form mere incremental lines. The rounded shoulder forming the sinal area bears 6 slender spiral threads. Anterior to this, the whorls are marked by 9 stronger spiral cords which are separated by spaces about as wide as the spiral cords. On the last turn the spiral sculpture also becomes much reduced; 16 threads are here indicated. Base well rounded and marked by incremental lines and spiral threads a trifl stronger than those on the spire. Columella moderately stout, slightly concave on the left side, and marked by spiral threads of about the same strength as those on the base on its posterior half. On the anterior half the spiral markings become very fine. Aperture ovate. Posterior sinus immediately below the summit, moderately deep and rounded. Anterior to the posterior sinus the outer lip is protracted. The inner lip is reflected over the cokumella as a thin callus which extends up on the parietal wall." " The fine axial ribs and fine spiral sculpture of the last 1.5 whorls will readily distinguish this species from the other here described ."

Genus Granotoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p. 5
Type (o.d.): Granotoma krausei (Dall)- Bela krausei Dall (fig.9).

Granotoma krausei (Dall),1886. Port Etches, Alaska (Dall) and Shuyak Strait, Afognak Island, Alaska,1924 (Eyerdam). Type Loc.: Port Etches
Granotoma excurvata (Carpenter),1865. Bristol Bay, Bering Sea to Puget Sound. Type locality: Puget Sound.

Collecting data: Akutan Island, Aleutians (I. Norberg) (Eyerdam); Port Vita (Eyerdam); British Columbia (Stanford Collection); off San Juan Islands, Puget Sound (T. Kincaid).

Genus Nodotoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p. 5
Type (o.d.): Nodotoma impressa (Beck) Morch (fig.2).

Nodotoma impressa (Beck) (Morch),1869. Seahorse Islands, Arctic Ocean to Kodiak Island, Alaska. Circumboreal. Type Loc.: Bellsound (Kroyer).

Collecting data: Isfjord, Coles Bay, Norway;1869 (Soot-Ryen)(Eyerdam).

Genus Oenopota Moerch,1852. Type (s.d. Dall,1919, p.40): Pleurotoma pleurotomaria Couthouy. Bela pyramidalis Strom. considered a synonym of pleurotomiaria Couthouy by Grant and Gale,1931, fgd. Tryon 1884 (Pl. 28, f.40). ? Subfamily . Recent, Massachusetts Bay. Recommeneded as substitute for " Bela" auct. by Iredale,1915, p. 229. Equals Lora auct. non Gistel.

The above data from Powell (Ref. Abve.). Dr. Bartsch in his 1941 paper redescribes the genus, pp4,5.

Oenopota pleurotomaria (Couthouy),1838. Nunivak Island, Bering Sea to Puget Sound. Also Atlantic. Type Loc.: Mass. Bay in deep water.

Collecting data: Drier Bay, Knight Island, Alaska,1923 (Eyerdam); British Columbia (Stanford Coll.); Tromsofjord, Norway,1935 (I. Norberg) (Eyerdam);
Oenopota alaskensis (Dall),1871. Bering Sea to Puget Sound.
Type locality: Unga Island of the Shumagin Group in the North Harbor in 4 fms.

Collecting data: Izhut Bay, Afognak Id.,and Drier Bay, Knight Id., Alaska (Eyerdam); British Columbia to Puget Sound (Stanford Coll.); Kanatak Lagoon, Portage Bay, Alaska in 3 fms. (G.D. Hanna, Calif. Acad. Sci.).
Oenopota rosea (M. Sars), 1846. Simeonoff Island, Shumagins to San Juan Islands, Puget Sound. Type locality: Arctic ?

Collecting data: Izhut Bay, Afognak Island, Alaska (Eyerdam); Queen Charlotte Islands (Stanford Coll.); Portage Bay, Alaska midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna, Calif. Acad. Sci.); off San Juan Islands, Wash. (T. Kincaid).

Genus Bellaspira Conrad,1868 (p. 133). Type (monotypy): Mangelia virginiana Conrad. (Yorktown) Upper Miocene, Virginia.

This genus was discussed and figured by Bartsch and Rehder,1939, Proc. U.S.N.M., vol. 87, pp. 133,134. There has been considerable discussion about the generic allocation of our southern California species grippii Dall. It was listed in Bull. 112 as Lora grippii, but it has been the almost unanimous opinion of students that this species certainly does not belong here. It has been placed in Bellaspira by a number of recent authors. We place it here tentatively.
Bellaspira grippii (Dall),1908. Redondo Beach in 25 fms. (Burch), Catalina

(con.)

Island to Todos Santos Bay. Type locality: off San Diego Bay.

Collecting data: San Diego (Stanford Coll.); off Malaga Cove in 15 fms.; off Redondo Beach 15-25 fms.; off Avalon, Catalina Island in 25 fms.(Burch).

The following species will be listed as " Lora".

" Lora" albrechti Krause,1885. Plover Bay, Bering Strait to Port Etches, Alaska. Type locality: Plover Bay.

Collecting data: Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant, Calif. Acad. Sci.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott, C.A.S.).

" Lora" alitakensis Dall,1919. Unimak Island, Aleutians, to Alitak Bay, Kodiak Island, Alaska. Type locality : Unimak Island.

Collecting data: Shuyak Strait, Afognak Island,1924 (Eyerdam);

" Lora" althorpensis Dall,1919. Shuyak Strait, Afognak Island, Alaska 1924 (Eyerdam) to Granite Cove,Port Althorp, Alaska. Type Loc.:Port Althorp.

Collecting data: off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna, R.L. Tallant & C.E. Leach, C.A.S. Coll.).

" Lora" amiata Dall,1919. Belkoffski, Alaska.

" Lora" arctica A. Adams, 1855. Shumagin Islands to Chirikoff Id.,Alaska. Type locality: Arctic Seas. Coll. Data: Chirikoff Id. (Stanford Coll.)

" Lora" babylonia Dall,1919. Off Tillamook, Oregon, in 786 fathoms.

" Lora" bechtii Moller,1842. Bernard Harbor, Arctic Coast to Drier Bay, Knight Island, Alaska (Eyerdam). Type Loc.: Arctic

Collecting data: Tromso, Norway,(L. Norberg) (Eyerdam).

" Lora" bicarinata Couthouy,1838. Point Belcher, Arctic Ocean to Puget Sound, Circumboreal. Type Loc.: east of Nahant, from stomachof haddock.

" Lora" casentina Dall,1919. Off Pt. Pinos, Calif. in 871 fms.

" Lora" chiachiana Dall,1919. Arctic Ocean to Chiachi Islands and Port Althorp, Alaska. Type Locality: Chiachi Islands, Aleutians.

Collecting data: Drier Bay, Knight Id., Alaska,1923 (Eyerdam).

" Lora" colpoica Dall,1919 (colpoica) Tillamook, Ore. in 786 fms.

" Lora" diegensis Dall,1919. Off La Jolla, Calif. to Cape San Quentin,L.C. Type locality: off San Diego.

" Lora" elegans Moller,1842. Blizhni Islands to St. Lawrence Island, Bering Sea. Type locality not known.

Collecting data: Hammero, Norway (Dr. Soot-Ryen) (Eyerdam).

" Lora" exarata Moller,1842. Arctic Ocean to Monterey, Calif. in 581 fms. Circumboreal. Type Locality : Greenland.

Collecting data: Tromso, Norway (Dr . Soot-Ryen) (Eyerdam). Mr. Eyerdam also lists a subspecies mitrula from Tromso, Norway.

" Lora" exserta Aurivillius,1885. Listed as subspecies of bicarinata in some lists. Arctic Ocean, north of Bering Strait.

" Lora" fidicula Gould,1849. Aleutian Islands to Puget Sound. Type locality: Puget Sound. Collecting data: British Columbia to Puget Sound (Stanford Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott, Calif. Acad. Sci.); Izhut Bay, Afognak Id.,1922 and Drier Bay, Knight Id., 1923,Alaska (Eyerdam); off San Juan Islands, Puget Sound (T. Kincaid) (Burch).

" Lora" fiora Dall,1919. Adakh Island, Aleutians to Sitka, Alaska. Type locality: Adakh Island.

" Lora" galgana Dall,1919. Unalaska, Aleutian Islands in 351 fathoms.

" Lora" harpa Dall,1884. Arctic Ocean, Queen Charlotte Ids., Circumboreal. Type locality: Nunivak Island, Alaska. Coll. Data: Izhut Bay, Afognak Id. Alaska (Eyerdam).

" Lora" harpularia Couthouy, 1838. Point Belcher, Arctic Ocean,to Puget Sound. Circumboreal. Type locality: from a cod taken off Phillips Pt., Lynn, Mass. Drier Bay, Knight Id.(Eyerdam); Tromsosund,Norway (I. Norberg).

" Lora" healyi Dall,1919. Arctic Ocean north of Bering Sea.

" Lora" incisula Verrill,1882. St. Lawrence Bay, Bering Strait. Atlantic. Type locality: Labrador.

" Lora" inequita Dall,1919. Plover Bay to Vancouver Island, B.C. (Eyerdam). Type locality: Plover Bay, Bering Sea. Coll. Data: Unalaska I. (Eyerdam).

" Lora" kyskana Dall,1919. Kyska Island, Alaska to Puget Sound Type locality: Kyska Island. Collecting data: Illiulliuk Bay; Unalaska, Aleutian Islands, 1932 (Eyerdam); Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant, C.A.S. Coll.); off Kanatak, Portage Bay, Alaska in 6 fms. (G.D. Hanna, C.A.S. Coll.); off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska, in 6-13 fms. (G.D. Hanna, R.L. Tallant & C.E. Leach- C.A.S. Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S. Coll.).

" Lora" laevigata Dall,1871. Kotzebue and Norton Sounds to Chirikoff Id., Alaska. Type locality: Norton Sound, Alaska.

" Lora" lawrenceana Dall,1919. Point Belcher, Arctic Ocean to Pribilof Islands, Bering Sea. Type Loc.: Plover Bay.

" Lora " lotta Dall,1919. Queen Charlotte Islands, B.C. to San Diego. Type Loc.: Queen Charlotte Islands.

" Lora" lutkeni Dall,1919. Port Etches, Alaska.

" Lora" lutkeana Krause,1885. St. Lawrence Bay, Bering Strait.

" Lora" maurellei Dall and Bartsch,1910. Barkley Sound, Vancouver Id., B.C .

" Lora" metschigmensis Krause,1885. Metchigme Bay,Bering Strait.

" Lora" miona Dall,1919. Unalaska; Aleutian Islands,1932 (Eyerdam) to Point Reyes, Calif. Type Loc.: Boca de Quadra, Alaska.

" Lora" mitrata Dall,1919. Bering Strait to Shumagin Islands. Type Locality: Port Clarence, Bering Strait.

" Lora" morchi Leche,1878. Blizhni Islands to St. Lawrence Island, Bering Sea and Drier Bay, Knight Id., Alaska (Eyerdam). Evanskjaer,Norway(Soot-Ryen); Tromsosund, Norway (I. Norberg) (Eyerdam).

" Lora" murdochiana Dall,1919. Point Barrow, Arctic Ocean to Pribiloff Islands, Bering Sea. Type Loc.: Cape Smythe, Arctic.

" Lora" nodulosa Krause,1886. St. Lawrence Bay, Bering Strait to Aleutian and Cook's Inlet. Type Loc.: St. Lawrence Bay.

" Lora" pavlova Dall,1919. Off Pribiloff Islands, Bering Sea in 987 fms.

" Lora" pitysa Dall,1919. Off Pt. Pinos to San Diego, Calif. Type L: San D.

" Lora" popovia Dall,1919. Bristol Bay, Bering Sea to Point Pinos, Calif. Type locality: Bristol Bay. Coll. Data: Off Lee's Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna, R.L. Tallant, & C.E. Leach- C.A.S. Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S. Coll.).

" Lora" pyramidalis Strom.,1788. It is likely that this species will be incorrectly placed. Grant and Gale were disposed to place both pleurotomaria (which we placed in Oenopota and haliotropa Dall in the synonymy of this species. Collecting data: Akutan, Aleutian Islands,1931 (Eyerdam); Tromso, Norway (I. Norberg) (Eyerdam); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S.). off Friday Harbor, Wash. (T. Kincaid).

" Lora" priblova Dall,1919. Cape Lisburne, Arctic Ocean to Esteros Bay, Calif. Type Loc.: Cape Lisburne. Coll. Data: San Juan Ids.(Kincaid); Chicagof Id. (Norberg); Izut Bay, Afognak Id. (Eyerdam);British C.(Stanford)

" Lora" quadra Dall,1919. Unalaska,Aleutian Islands to Puget Sound. Type locality: Unalaska. Collecting data: off Friday Harbor, Wash. (Kincaid) Drier Bay, Knight Id. and Evans Id., Pr. Wm. Snd., Alaska (Eyerdam); Akutan Id., Aleutians,1931 (I. Norberg) (Eyerdam); Kodiak to British Columbia (Stanford Coll.); Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant- C.A.S. Coll.).

" Lora" rassina Dall,1919. Off Bristol Bay, Bering Sea.

" Lora" regulus Dall,1919. Off Point Reyes, Calif. in 61 fms.

" Lora" rugulata Friele,1886. Unalaska Island (Eyerdam) and Akutan Id. (I. Norberg). Tromsosund, Norway (Dr. Soot-Ryen).

" Lora" rugulata spitzbergensis Friele,1886. Plover Bay to Port Althorp, Alaska. Type locality: Magdalene Bay (Spitzbergen-Svarlbard),40-50 fms.

Collecting data: Unalaska, Aleutian Islands (Eyerdam).

" Lora" reticulata Brown,1827. See Grant and Gale, p. 522. Ill. Rec. Conch. Gt. Brit & Ire. Ed. 1, pl.48,figs. 29,30. Circumboreal. In the Atlantic south to Great Britain and Massachusetts, in the Pacific to San Diego. Type locality: Greenock, Scotland. Grant and Gale place a number of species in the synonymy.

Collecting data: Off Friday Harbor, Wash. (T. Kincaid- Iden. G. Willett); Akutan Island, Aleutians (Eyerdam); off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna,R.L. Tallant & C.E. Leach- CAS Coll.); Kanatak Lagoon, Portage Bay, Alaska in 3 fms. (G.D. Hanna- CAS); Portage Bay, Alaska, midway between Capes Igvakand Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- CAS Coll.).

" Lora" scalaris Moller,1842. Bering Sea to Sitka, Alaska. Circumboreal. Type locality: Greenland. Collecting data: Izhut Bay, Afognak Id.,Alaska (Eyerdam); Kodiak, Alaska (Stanford Coll.).

" Lora" simplex Middendorff,1849. Point Barrow, Arctic Ocean to Pribilof Islands and the Okhotsk Sea. Type locality: Okhotsk Sea.

" Lora" sixta Dall,1919. Off San Diego, Calif. in 640 fms.

" Lora" solida Dall,1886. Bering Sea to Puget Sound. Type locality:Harbor of Kyska, Alaska. Collecting data: Izhut Bay, Afognak Island,1922; Drier Bay,1923; Unalaska 1932 (Eyerdam); British Columbia (Stanford Coll.); Kodiak, Alaska in 6-10 fms. (G.D. Hanna & R.L. Tallant- CAS); off Kanatak Portage Bay, Alaska in 6 fms. (G.D. Hanna- CAS); Portage Bay, Alaska midway between Igvak and Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- CAS).

" Lora" surana Dall,1919. Off Pt. Sur and Pt. Pinos, Calif. Type loc.:off Pt. Sur.

" Lora" tabulata Carpenter,1865. Sitka, Alaska to Monterey, Calif. Type locality: Neah Bay, Wash. Collecting data: British Columbia to Puget Sound (Stanford Coll.); off Friday Harbor, Wash. (T. Kincaid)

" Lora" tenuicostata M. Sars,1868. St. Lawrence and Nunivak Islands,Bering Sea to Safly Cove, Alaska. Also Atlantic. Type locality: Vadso.

" Lora" tenuilirata Dall,1871. Point Barrow, Arctic Ocean to Shumagin Islands, Alaska. Type locality: Norton Sound, Alaska. Arctic(Stanford)

" Lora" tenuilirata cymata Dall,1919. Nunivak Island, Bering Sea to Shumagin Islands. Type Loc.: Nunivak Id. Alaska (Stanford Coll.).

" Lora" tenuissima Dall,1919. Chernoffski Harbor,Unalaska Id. in 109 fms.

" Lora" trevelliana Turton,1834. Arctic Ocean southward to Behn Canal, Alaska. Circumboreal. Type locality: Scarborough. Tromso,Norway(Norberg).

" Lora"violacea Mighels and Adams,1842. Sea Horse Islands, Arctic Ocean, to Bering Sea to Sitka, Alaska. Circumboreal. Type locality: Casco Bay,Maine.

Collecting data: Hammero,Norway (Dr. Soot-Ryen); Treurenburg Bay, Spitzbergen, 3-14 fms. sand,1861 (Eyerdam)

" Lora" woodiana Moller,1848. White Island, Arctic Ocean to north of Bering Sea. Type locality: Arctic.

" Lora" sp. cf. kyskana Dall,1918. We dredged a species off Redondo Beach, Calif. in 75 to 125 fms. that was identified by Mr. George Willett as " Lora" kyskana. Mr. Willett had a great deal of experience with this northern group but we hesitate to extend a range all he way to southern California without further study.

Genus Pleurotomella Verrill,1873.(p. 15). Type (monotypy): P. packardi Verril. Recent, N.E. coast of U.S.A.

Pleurotomella thalassica Dall,1919. Offf Tillamook, Ore. in 786 fathoms.
Pleurotomella herminea Dall,1919. Off Catalina Island, Calif. in 334 to 600 fathoms.

Genus Clathurella Carpenter,1857 (p. 399). Inasmuchas so many of our members have followed Grant and Gale in the use of this name it seems that we should discuss it here. My limited study of the matter seems to leave me disposed to think that we have more trouble on our hands with the use of the name Clathurella than we would have by simply retaining our old names until Dr. Bartsch or someone convinces us that we should use another. The data below is copied from Powell (Ref. above):
Clathurella Carpenter,1857. Nom. nov. for Defrancia Millet,1827 , non Bronn, 1825.Type (s.d. Dall,1908, p. 260): Defrancia pagoda Millet,1827. (Helvetian) Miocene,Turin, Italy. See Pleurotomoides Bronn,1831.
Grant and Gale (1931, p. 604) and Pilsbry and Lowe (1932, p.55) endeavored to preserve Clathurella on the basis of Cossmann's designation(1896 p. 121) of the Recent Clavatula rava Hinds. As Defrancia was proposed with out a designated type, then Clathurella, published as a substitute name for Millet's Defrancia, must take its type from among the five original species mentioned by Millet,notwithstanding the fact that Carpenter included other species in proposing his substitute name. As Carpenter did not designate a type then his nom. nov. has to be treated strictly as such. Cossmann's designation is invalid because rava was one of Carpenter's inclusions, not in Millet's list."

Mr. A.M. Strong comments on these species as follows: " In the species with the flaring or varicose outer lip no one seems to make any distinction between those with a dentate lip and those with a smooth lip. Philbertia does not seem to be a valid name, at least on the coast. I am using two genera, Clathurella and Glyphostoma, the first with the stubby shell and a short canal and the second with a slender shell and a long canal. In Clathurella I am placing C. affinis, C. conradiana, C. canfieldi and C. crystallina. I think the record of C. rava from San Diego must be a mistake. In Glyphostoma I am placing G. adrana, G. atria and G. cymodoce."
However, whether these names can be retained as Dall used them or not I do not know, but until the dispute is more or less settled perhaps we had as well use the names we now have on our specimens.

Genus Glyphostoma Gabb,1872 (p. 271). Type (monotypy): G. dentiferum Gabb. Miocene, Domican Republic.

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Glyphostoma conradiana Gabb,1869. Off Redondo Beach, Calif. in 25-50 fms. (Burch) and San Pedro, Calif. Also Pleistocene. Type locality: Post-Pliocene of Santa Barbara.

Collecting data: San Pedro; Redondo in 20 fms. (Lowe); also fossil from Timm's Point, Hilltop Quarry and other deposits. (Burch); Portuguese Bnd.

Glyphostoma adria Dall,1919. San Pedro, Calif. to Acapulco, Mexico (Lowe).

Dr. A. Myra Keen advises on this species " The description in Oldroyd is of another species. The type locality is Santa Maria Bay, Lower Calif. "

This is a little odd because Oldroyd did give the correct reference: Proc. USNM, 56:52; pl.17,fig.5, The original description follows: " Shell small, slender, acute; pale brownish, or with still paler nebulosity; with three darker brown nuclear whorls, the first minute, the others regularly increasing with a deep suture; subsequent whorls seven, the first peripherally keeled, the periphery rather anterior; subsequent whorls with a broad spirally striated anal fasciole followed by 2 or 3 spiral cords strongest where they cross the ribs and feebler in the interspaces; on the last whorl the cords are less prominent, with about equal spirally striated interspaces, and the cords continue becoming more close settoward and upon the canal to the number of 15 or more; axial sculpture of (on the last whorl 10, excluding the terminal varix) protractively oblique ribs extending from in from of the anal fasciole stronger on the periphery and obsolete on the base of the whorl; terminal varix strong, the margin incurved smooth; the anal fasciole large, rounded; the lips callous with minute denticulations; the canal short, deep, recurved, the aperture rather narrow. Height of shell,10; of last whorl,6; diameter 4 mm. "

Collecting data: Acapulco, Mexico in 20 fms.; Punta Penasco, Sonora in 10 fms.; Guaymas,Mex. in 20 fms.; Santa Maria Bay in 15 fms.; Conception Bay in 20 fms. (Lowe).

Glyphostoma cymodoce Dall,1919. Monterey to Redondo Beach, Calif. (Burch). Type locality: Santa Barbara, Calif.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. mud bottom (Burch); Cayucos (Lowe) (San Diego Museum).

Genus Philbertia Monterosato,1884 (p.132). Type (tautonomy): Pleurotoma philberti Michaud. Recent, Mediterranean (in synonymy of Pleurotoma bicolor Risso).

Philbertia affinis Dall,1871. San Luis Obispo (Oldroyd) to Tres Marias Islands, Mexico (Strong and Hanna). Type locality: Capo San Lucas, L.C.

Collecting data: Bird Rock, San Diego Co. and Punta Banda, L.C.,Mex. both littoral (Burch);

Philbertia canfieldi Dall,1871. Crescent City, Calif. to San Diego (Kelsey). Type locality: Monterey, Calif. Coll. Data: Cayucos, San Luis Obispo C. . (Burch).

Philbertia capaniola Dall,1919. Off San Diego, Calif.

Philbertia castianira Dall,1919. Off Cape San Martin, Calif.

Philbertia crystallina Gabb,1865. Off Catalina Island and off Redondo Beach in 50-100 fms. (Burch). Type locality: off Catalina in 50 fms.

Off Catalina in 35 fms. (Lowe) (San Diego Museum). Fossil in San Pedro Pleistocene (Burch); Whites Landing; off Catalina (Strong).

Philbertia hesione Dall,1919. Point Pinos to Point Loma, Calif. Type locality: off Santa Rosa Island, Calif.

Philbertia louisa Dall,1919. Off San Luis Obispo, Calif.

Philbertia rava Hinds, 1843. Laguna Beach, Calif. to Gulf of Calif. (Dall) Type Loc.: Gulf of Nicoya,Central Amer. Mr. Strong thinks Calif. records error.

Genus Mangelia Risso,1826. Type (s.d. Hermannsen 1852, p. 80): Mangelia striolata Risso = Pleurotoma villiersii Michaud = Murex attenuatus Montagu.

Woodring, Wendell P. " Miocene Mollusks from Bowden,Jamaica", Carnegie Institution of Washington,Publication No. 385, 1928, on pages 177,178 in his description and discussion of his new genus Glyphoturris discusses this problem at length. Dr. Woodring suggests the use of Bela Gray for Mangelia auct.

In any event it seems certain that the species grouped under this name by Dr. Dall in Bull. 112 will be allocated to a number of different genera. Dr. Paul Bartsch has described several new genera to take a number of the species in his recent papers referred to above.

Dr. Dall spelled this name Mangilia on the theory that the original spelling Mangelia was a typographical error. However, it has been my understanding that unless the original spelling was suchas to make the name fail to comply with the Rules, the original spelling must stand even though the author himself should attempt to correct it in later publications. This is an interesting point and I will appreciate being informed because Dr. Baily, our west coast authority on such matters, seems disposed to spell it Mangilia.

Dr. Joshua L. Baily Jr. comments on this problem as follows: (Per. Comm. May,1946) " Mangilia (Leach MS) Risso,1826. I would like to know whether in considering Mangilia striolata as the generitype you were following Grant and Gale, or whether you arrived at this conclusion independently. Grant and Gale reject Dall's claim that Bellardi designated M. costulata as type on the ground that Bellardi mentioned M. costulata only in the synonymy. But they do not say what he made it a synonym of, nor do they say what species if any he did designate as type. Until we consult Bellardi's work I do not believe we can make a choice between these two. I had prepared a letter to the International Committee about the spelling of this name, when it occured to me that the question of the type should be settled too. When the International Commission places a name on the official list they give the type as well, and as long as there is doubt as to the type this must be cleared up before any other question can be settled. Consequently it would be very helpful to me to know on what ground you reject Bellardi'd supposed designation."

" Mitromorpha- This group is generally placed in the Mitridae. Grant and Gale make it a subgenus of Mangilia. They are undoubtedly correct in placing it here instead of the Mitridae, but I question them in making it a subgenus. They (and lots of others too) have made genera of shells not nearly so distinct as Mitromorpha."

In regard to the last, we discussed this genus and the species in it in our Minutes # 49, p. 33,34, June,1945. Our decision was to transfer Mitromorpha to the family Turridae but retain it as a distinct genus as suggested by Dr. Baily.

There seems to be little doubt but that the species placed under Mangelia by Dr. Dall will be allocated to a number of different genera. Dr. Bartsch in his 1944 papers described two new genera, Kurtzia and Kurtzina for certain species which will be discussed later. The other species we will simply list in alphabetical order as " Mangelia."

Furthermore, there is a general feeling that we have far too many names and that many of the described species should be placed in the synonymy of others.

Genus Kurtzia Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57:62,63. Type (o.d.): Kurtzia arteaga Dalland Bartsch. (= Mangilia arteaga Dall and Bartsch,1910).

Kurtzia arteaga Dall and Bartsch,1910. Vancouver Island to San Diego, Calif. Tupe locality: Barkley Sound, Vancouver Island.
Kurtzia arteaga roperi Dall,1919. Monterey to Cape San Lucas
Type locality: Monterey, Calif.

Collecting data: Dredged off Monterey in 20 fms. on shale; also 40 fms.; off Redondo Beach, Calif. in 25-50 fms. graveland shell bottom; off Avalon Catalina Island in 25 fms.; off Ensenada,Todos Santos Bay, Lower Calif. in 20fms.; (Burch); off San Pedro in 10 fms. (White) (San Diego Museum).
Kurtzia gordoni Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57,p. 65.
Type locality: off Santa Cruz, Calif. in 43-46 fms. on green mud bottom.

The description follows: Shell small,very elongate-conic, wax colored. The nucleus consists of an initial stage of 1.5 smooth turns followed by a fraction of a whorl that shows a couple of weak, rounded, flattened spiral threads. This is succeeded by two turns having strongly developed axial ribs whichare protractively curved and narrower than the spaces that separate them, and 2 spiral cords, one of which forms the strong median angle, while the other is located half way between this and the suture. The post-nuclear whorls are strongly angulated in the middle with the gently sloping shoulder posterior to this. Theyare marked by almost vertical axial ribs,of which 9 are present on the penultimate and the last turn. These ribs are very strong and about half as wide as the spaces that separate them. The spiral sculpture consists of a strong cord on the middle of the turns which marks the angulation,and a lesser cord midway between this and the periphery, the periphery being marked by another strong cord. Between the summit and median angulation, 13 slender rounded spiral threads are present, 3 additional ones occuring on the cord at the anglewhile the space betweenthisand the cord anteriorto it is marked by 7 similar threads; the cord itself also bears 3 threadsand the space between thisand the sutural cord bears 8 spiral threads with 3 additional threads on the peripheral cord. These cords are rendered minutely nodulose by the axial threads whichare about as wide as the spaces that separate them. The nodules are very regular and rounded and give to the surface of the whorls a finely granulated appearance. Base rather long and marked by 4 spiral cords about half as strong as those on the spire between which finely granulose spiral threadsare present. Of thse, 6 are present between the periphery and first cord, 5 between thatand the second cord, and 4 between thatand the third cord. The columella is slender, slightly twisted and bears spiral cords which become consecutively weaker fromthe insertion to the tip of the columella. Nine of these spiral cords are present, and betweenthem finely granulose threads. The fine nodules of spire, base,and columella are of similar strength and give that finer sculpture a quite uniform aspect. Aperture elongate-ovate. The outer lip with the posterior sinus between the summit and the median angulation. This is rather deepand rounded. Anterior to the sinus the outer lip is protractedand rendered sinuous by the heavier axial sculpture. Anterior canal moderately broad and moderately long. The inner lip appears on the columella as a resorption area which extends up on the parietal wall. The operculum is thin, oval with apical nucleus and concentric lines of growth. The radula bears dagger- shaped marginals only." Type has 7 postnuclear whorls-Ht. 10mm.; greater diam. 3.5"

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" This species was refered to Mangelia arteaga roperi Dall by Dall , but is sufficiently distinct to merit specific separation. It is much larger than roperi with a much more acutely sloping shoulder and much shorter aperture."

Genus Kurtzina Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57,p.64. Type (o.d.); Kurtzina beata (Dall) (= Mangelia (Kurtziella) beata Dall.)

Dr. Bartsch states that there are a number of west coast species in this genus ranging from California to the Gulf of California but does not state what species. They will therefore be contained in our list of"Mangelia"

" Mangelia" alesidonta Dall,1919. Catalina Island, Calif.

" Mangelia" aleutica Dall,1871. Cape Sabine, Arctic Ocean to Fuca Strait . Type locality: Unga Island, of the Shumagin Group in the North Harbor.

" Mangelia" althorpi Dall,1919. Granite Cove, Port Slthorp, Alaska (Type Loc.), and Craig, Pr. of Wales Id. and Chicagoff Id., Alaska (I. Norberg) (Eyerdam).

" Mangelia" barbarensis Oldroyd,1927. New name for M. angulata Carp,1865. Type locality: Santa Barbara, Calif.

Many of us have been following Mr. George Willett in placing this species in the synonymy of variegata Carpenter.

" Mangelia"beta Dall,1919. Point Ano Nuevo, Calif. in 67 fms.

We identified specimens as this species from our dredgings off Santa Monica, Calif. in 15-25 fms. and also off Palos Verdes in 25-50 fms., but were convinced by Mr. Willett's specimens that beta should be placed in the synonymy of variegata Carpenter.(Burch).

" Mangelia" carlottae Dall,1919. Off Queen Charlotte Islands, British Columbia in 876 fathoms.

" Mangelia" cesta Dall,1919. Monterey to San Pedro.to San Diego (White) Type locality: San Pedro. Coll. Data: San Pedro (Lowe); Cayucos,Calif. (Burch); Pt. Loma (White).

" Mangelia" cetolaca Dall,1908. Lower Calif. to Salina Cruz, Mexico. This species is probably not found in our Recent fauna although common enough in many of our Pleistocene deposits. Grant and Gale placed it in the synonymy of perattenuata Dall,1905 . However, Mr. George Willett in his Baldwin Hills paper, Trans. San Diego Soc. Nat. Hist,1937, p.395 took issue with this and held cetolaca to be distinct.

" Mangelia" constricta Gabb,1865. Catalina Island in 80 fms.

" Mangelia" crebricostata Carpenter,1865. Forrester Island, Alaska to Monterey, Calif. Type locality: Neah Bay, Wash.

Collecting data: Victoria, B.C. (Eyerdam).

" Mangelia" criopsis Dall,1919. Forrester Island, Alaska and the Queen Charlotte Islands. Type locality: Forrester Island.

Grant and Gale place this species in the synonymy of Lora alaskensis (Dall). ?

" Mangelia" eriphyle Dall,1919. Off Esteros Bay, Calif. to Coronado Islands. Type locality: off Santa Rosa Island.

" Mangelia" evadne Dall,1919. Off Santa Rosa Island, Calif. in 53 fms.

" Mangelia" granitica Dall,1919. Granite Cove, Port Althorp, Alaska.

" Mangelia" hamata Carpenter,1865. Ann. and Mag. Nat. Hist. Ser. 3, vol. 15, p. 399, May,1865, reprinted in Smithsonian Misc. Coll. No. 252. p. 293, (bottom pagination),1872. Dall, Proc. U.S.N.M., vol. 56,p.71,1919. Eric Knight Jordan in Bull. So. Calif. Acad. of Sci.,vol.23,1924, p.154 gives the range of this species as San Diego (Gripp), Pt. Sbreojos) H.)

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to Panama. Dr. Dall states that the type specimen resembles a fossil suchas found in the Santa Barbara Pleistocene. In any event this species seems to be greatly misunderstood. Mr. Wm. K. Emerson of San Diego sent me some specimens that heand others had been collecting alive on sponges on the pilings in Mission Baya nd identifying as this species. The shells were the same species we have been labelling M. merita Hinds. Dr. Dall stated that the type of hamata resembles a Cytharella. Grant and Gale suggest that it may be identical with Philbertia canfieldi. Dr. A.M. Keen listed it as a member of our Recent fauna on the Eric Jordan reference, but in the light of the above comments perhaps we should first find out what it really is.

" Mangelia" hebe Dall,1919. San Diego.

" Mangelia" hecetae Dalland Bartsch,1910. Vancouver to San Diego. Type locality: Barkley Sound, Vancouver Island, B.C.

We have been following Mr. George Willett in placing this species in the synonymy of M. variegata Carpenter. Grant and Gale do not recognize or rather agree with this and use both variegata and hecetae. They place angulata - barbarensis and beta in the synonymy of this species.

Eyerdam reports it from Victoria, B.C.

" Mangelia" hooveri Arnold ,1903. San Pedro to San Diego, Calif. Type locality: San Pedro Pleistocene.

Apparently the only record of this species Recent is to be infered f from Dall's range. Granta nd Gale state that it is close to variegata.

" Mangelia" interfossa Carpenter,1865. Discussed as Mitromorpha in Minutes 49: 33,34.

" Mangelia" interlirata Stearns, 1871. Monterey to San Martin Island (Baker). Type locality: Monterey.

Granta nd Gale place cesta Dall,1919 in the synonymy.

Collecting data: Dredged off Monterey and also Pacific Grove in 15-20 fms. (Burch); San Diego (Gripp); San Clemente Island (Lowe);

" Mangelia" fredbakeri Pilsbry,1932. Nautilus 45:124,125. This species is a Lower Californian species and not reported from our fauna. Dr. A.M. Keen advises as follows: " For M. lineolata read M. fredbakeri Pilsbry 1932. (Nautilus 45, p. 124, pl.11, fig.11). Type locality: San Hipolito Pt., Lower California. As Pilsbry shows the true lineolata of Reeve is not our west coast shell."

Addition and Correction-.

Anachis (Chauvetia) lineolata (Gray in Reeve),1846. Reeve, Conch. Icon. vol. 1, Pleurotoma, pl.37, fig. 337. Granta nd Gale, 1931, p. 686, pl.26, figs. 31,34 discuss this species.

Range: Catalina Island to Panama and the Galapagos Islands (Dall). Grant and Gale describe it more fully. This species was overlooked in our discussions of Anachis, Minutes 51:22,23.

" Mangelia" levidensis Carpenter,1864. Bering Strait to Monterey, Calif. Type locality: (advice of Dr. A.M. Keen) " The type locality of M. levidensis Carpenter,1864 is Puget Sound- Vancouver Island.

Collecting data: dredged off San Juan Islands,1940 (T. Kincaid); Monterey; Puget Sound (Oldroyd), Unalaska, Aleutian Islands (Eyerdam).

" Mangelia" newcombei Dall,1919. Vancouver Island to Drake's Bay,Calif. Type locality: Clayoquat Sound, Vancouver Island.

Grantand Gale place newcombei in the synonymy of crebricostata Carp.

" Mangelia" pulchrior Dall,1919. New name for M. nitens Carpenter,1864. Monterey, Calif. to Magdalena Bay, L.C. (Dall). Type Loc.: Sta. Barbara.

It has been my policy to place pulchrior * nitens in the synonymy of variegata following George Willett and also Grant and Gale on this. However, there is a differenceof opinion. We have shells labelled pulchrior from Allyn G. Smith collected at Pacific Grove, Calif. However, see the discussion of variegata. Dr. A.M. Keen in Abridged Check List gives nitens Carp. with pulchrior apparently in synonymy.

" Mangelia" nunikavensis Dall,1919. Nunivak Island, Bering Sea.

" Mangelia" oldroydi Arnold,1903. This species was lat r renamed M. cetolaca . We mention it because it was listed by Dall in Bull. 112 giving only Pleistocene of San Pedro. However, Mr. George Willett in one of his early papers, Nautilus 33:21 reports it from Forrester Island, Alaska. As discussed above Grant and Gale followed by others have placed cetolaca in the synonymy of perattenuata Dall, but this has not been fully accepted.

" Mangelia" oenoa Dall,1919. San Pedro, San Diego to Gulf of Calif.(Dall). Type Loc.: San Pedro, Calif.

This species is placed in the synonymy of variegata by both George Willett and Grant and Gale. We have been following them.

" Mangelia" painei Arnold,1903. San Pedro to San Diego (Dall). Type Loc.: Pleistocene of San Pedro.

Grant and Gale made this a subspecies of merita which we will discuss under Cytharella. However, we have no Recent records of the species, and Dall's range seems to be the only basis for retaining it in our fauna under any name.

" Mangelia" perattenuata Dall,1905. Monterey, Calif. (Dall). See discussion under cetolaca. Also Grant and Gale, 1931, p. 591. George Willett, Trans San Diego Soc.vol.8,p. 395.

" Mangelia" philodice Dall,1919. Point Ano Nuevo , Calif. to Coronado Islands. Type locality: off Pt. Pinos Light, Monterey.

" Mangelia" rhyssa Dall,1919. La Jolla, Calif. to Gulf of California. Dr. A. Myra Keen advises " " Type locality of M. rhyssa is according to the holotype label Gulf of California.

Collecting data: La Jolla, Calif. (Sweet) (Beckwith) (Bristol).

" Mangelia" sculpturata Dall,1886. Chiachi Islands to Port Etches, Alaska (Dall). to Monterey (Berry) and to San Diego (Gripp). Type locality: Aleutian Islands. Eyerdam reports it from Queen Charlotte Islands, B.C. The accuracy of the Montereyand the San Diego records may well be questioned.

" Mangelia" tersa Dall,1919. San Diego, Calif.

" Mangelia" variegata Carpenter,1864. Brit. Assn. Adv. Sci. Rept. for 1863, p. 658, 1864; Ann. and Mag. Nat. Hist.. Ser. 3, vol. 15,p. 394, 1865; descriptions reprinted in Smithsonian Misc. Coll. no. 252,pp. 144, 284,1872. Grant and Gale,1931, pp. 590,591; Willett, Trans. San Diego Soc. vol.8, pp. 394,395, 1937.

Range : Monterey to Gulf of California. /Alaska south to Type Loc.: Santa Barbara. Mr. George Willett in his Baldwin Hills paper referred to above gives the following: " Mangelia (Beta) variegata Carpenter.- Syn. M. angulata Cpr . not Reeve (Arnold,1903; Dall,1921): M. oenoa Dall, M. pulchrior Dall, M. beta Dall (Dall,1921; Oldroyd,1927): M. barbarensis Oldroyd (1927), " M. hecetae Dall and Bartsch" (Grant and Gale,1931).- (1800). Our specimens of this species exhibit every variation between typical variegata

(con.)

and the other forms listed in the above synonymy. Plate 26, fig. 1, shows intergradation between the two extremes, typical variegata on the one hand, and the angulated variety on the other. That this intergradation also occurs at the present time is indicated by specimens in the writer's collection. While, as Grant and Gale point out (1931, p. 593), the shell of M. hecetae Dall is indistinguishable from some specimens of the angulated form of variegata, an example of hecetae in the writer's collection, taken in southeastern Alaska, possesses an operculum, which, according to our present understanding, would place it in the genus Lora."

Collecting data: off Monterey in 20 fms. shale, common; off Santa Monica, 15 fms.; Redondo Beach 15-50 fms.; off Avalon, Catalina Island in 25 fms.; off Ensenada, Mexico in 15-50 fms.; littoral at Anaheim Landing; Palos Verdes; Malaga Cove; (Burch); off Friday Harbor, Wash. (T. Kincaid) (Burch).

Genus Cytharella Monterosato, 1875. Type (s.d. Woodring, 1928, p. 168) : Murex costatus Donovan. Recent, Europe. Dall's 1918 (p. 325) designation of Pleurotoma bertrandi Payraudeau considered invalid by Woodring, 1928, p. 168.

Cytharella aculea Dall, 1918. San Diego, Calif. to Cape San Lucas.
Type locality: San Diego, Calif.
Cytharella amatula Dall, 1919. Monterey, Calif. (Oldroyd in Stanford Coll.) south to San Diego, Calif. Type Loc. : San Diego. San D. (Mrs. Oldroyd)
Cytharella branneri Arnold, 1903. San Pedro to San Diego, Pleistocene and Recent to Panama. Type locality: San Pedro Pleistocene.

Grant and Gale place this in the synonymy of hexagona Gabb.

Stanford University collection collection has sets from San Pedro and San Diego collected by Gripp. / to Todos Santos Bay (Burch)

Cytharella hexagona (Gabb), 1865. Monterey to San Diego. Panama (Dall)?
Type locality: " One specimen from Catalina Island, 40 fms., another from the beach at Monterey."

Grant and Gale consider this " Mangelia s.s.".

Collecting data: dredged off Monterey in 20 fms. shale; off Redondo beach in 15-25 fms., common; off Avalon, Catalina Island in 25 fms.; off Malaga Cove in 15 fms.; off Ensenada, Mexico in 15 fms. (Burch); Catalina Island in 50 fms. (Lowe); South Coronado Island in 10 fms. (Baker).

Cytharella hippolita Dall, 1919. San Diego to Lower Calif. Nicaragua (Lowe)
Type locality: San Hippolito Pt., Lower Calif.

Collecting data: San Juan del Sur, Nicaragua (Lowe); San Hippolito Pt., L.C. (Lowe).

Cytharella louisa Dall, 1919. San Luis Obispo, Calif.

Reported from Cayucos, Calif., San Luis Obispo Co. (Lowe)(San Diego Mus.

Cytharella merita (Hinds), 1843. Monterey, Calif. to Mazatlan, Mex. (Lowe) to Central America. Type locality: Gulf of Nicoya, Central America.

Grant and Gale consider this Mangelia s.s.

Collecting data: San Simeon, Calif.; Cayucos, Calif.; Dana Pt., Orange Co., Calif.; Bird Rock, San Diego Co.; Mission Bay, San Diego Co.; Punta Banda, Lower Calif. (Burch); Mazatlan, Mexico ; Tepoca Bay, Sonora(Lowe).

Subgenus Agathotoma Cossmann, 1869. Nom. nov. for Ditoma Bellardi, 1877. Type (monotypy): Mangelia augusta Jan. Miocene and pliocene, Europe.

Cytharella densilineata Dall,1921. San Pedro to Guld of California (Dall). Dr. A. Myra Keenadvises regarding the type locality of this species as follows: " The date for C. densilineata Dall is 1921. The type locality is presumably that of the specimen Arnold figured, which should be Pleistocene of Signal Hill (" San Pedro series of Los Corritos") . Dall bestowed a new name without selecting a type specimen. Before the species is on firm footing someone must select a lectotype from among Arnold's specimens which are at Stanford."

Grant and Gale, 1931, p. 590 place this species in the synonymy of variegata Carpenter, placing it under " Mangelia" (Beta).

Collecting data: The San Diego Museum has a set labelled by Lowe as this species from off San Pedri in 15 fms.

Cytharella fusconotata Carpenter,1864. Laguna Beach, Calif. to Gulf of California. Type locality: Cape San Lucas, L.C.

Cytharella janeita Dall,1919. San Diego, Calif. to ~~Scammon's Lagoon~~ Catalina Island (Lowe). ~~Type locality: San~~ Diego, Calif.

Collecting data: off Catalina Island in 30 fms. (Lowe).

Cytharella pomara Dall,1919. San Pedro, Calif. (Lowe).

Genus Daphnella Hinds,1844. (p. 25). Type (s.d.) Hermannsen 1847, p. 370): Pleurotoma lymnaeformis Kiener. Recent," Indian Ocean and Ile de France".

Mr. A.M. Strong comments on the species placed here by Dr. Dall in Bull. 112 as follows: " Bartsch states that " Daphnella" clathrata Gabb belongs in the genus Eudaphana Bartsch. I do not know what D. fuscoligata Dall is but I do not think it belongs here."

" Daphnella" clathrata Gabb,1865. San Miguel Island to San Diego and Cortez Bank, Calif. Redondo Beach, Calif. (Burch). Type locality: Catalina Island in 60 fathoms.

Collecting data: Off Redondo Beach in 100 fms. (Burch); off Catalina Island in 30 fms. (Lowe); off Newport in 30 f,s. (Lowe).

" Daphnella" fuscoligata Dall,1871. Monterey to San Diego, Calif. Type locality: Monterey, Calif.

Grant and Gale renamed this species Mangelia crassaspera (1931-p 599). They placed the species in Mitromorpha which they considered a subgenus of Mangelia making the name fuscoligata preoccupied by rigida fuscoligata Carpenter. However, this proceedure has not been accepted generally.

Collecting data: Dredged off Monterey in 20 fms. on shale; also off Redondo Beach in 50 fms.; off Mdga Cove, L.A. Co. in 40 fms. (Burch); Laguna and Long Beach (Lowe);

Genus Taranis Jeffreys,1870. (p. 447). Type (monotypy): T. morchi Holm. Recent, Norway to Mediterranean, Atlantic Coast of U.S.A. to Gulf of Mexico.

Dr. Paul Bartsch in Nautilus 57:107,1944 in the notes states that it may become necessary to take Taranis out of the Turridae and make Taranidae a separate family. Soft parts do not fit the Turridae etc.

Taranis strongi Arnold,1903. Forrester Island, Alaska to San Diego. Type locality: San Pedro Pleistocene. Collecting data: Dredged off Redondo Beach, Calif. in 100 fms. mud bottom (Burch); Alaska (Lowe Collection).

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The following keys and data are taken from Mr. A.M. Strong's notebook.

Genus Turricula

Fasciole broad, concave, canal moderate to long ..... Turricula
. Shell elongate, with nodes or short ribs below the fasciole (Turricula s. s.
.. Spiral sculpture of slender cords
... Axial ribs about 8 ....nigricans
... Axial ribs about 12 ....naura (crusospira)
.. Spiral sculpture of fine striae only
... Axial ribs short, curved, protractive ....libya
... Axial ribs reduced to small, sharp nodes ....maculosa
. Shell fusiform, axial ribs indistinct ....(Pleurofusia)
.. Periphery with two spiral cords
... Peripheral spiral cords nodulous ....fusinella
...Peripheral spiral cords smooth ....dolenta
... Posterior peripheral cord stronger than anterior ..armilda
.. Periphery angulated with a single spiral cord
... Shell yellowish to light brown ....lavina
... Peripheral keel with regular brown spots .... arcuata

Genus Clavus

Spiral sculpture of cords or raised threads ....(Clathrodrillia)
. Whorls rounded, with distinct axial ribs
.. Spire with 4 or 5, body whorl with 1x spiral cords ..paxiana (sculpta)
.. Spire with 4, body whorl with about 20 spiral cords ..nautica
.. Spire with 7, body whorl with about 25 spiral cords ..callianira
. Whorls angulated, with the spiral cords predominating
.. Spire with 1, body whorl with 9 spiral cords
... Anal fasciole spirally striate .... halis
... Anal fasciole smooth ....soror
.. Spire with 1 or 2, body whorl with 6 or 7 spiral cords ..thestis
.. Spire with 2, body whorl with 8 spiral cords ....jaculum
.. Spire with 2 or 3, body whorl with about 12 major spiral cords.alcestis
.. Spire with 3, body whorl with 6 spiral cords .... heliplexa
.. Spire with 2 major and 2 minor spirals, body whorl with 18..adonis

Clavus panthea Dall of G. and G., p. 580, is described as without a callus and for this reason and others does not belong here.
Clavatula halis Dall of G. & G. p. 485, is described as not mature and nothing is said about the presence or absence of a callus. In other ways it clearly belongs in the group with Clathrodrillia.

Whorls with a distinct subsutural band .... (Crassispira)
. Axis of last whorl set at an angle with that of the spire
.. Body whorl with a single spiral row of small tubercles ..luctuosa
.. Body whorl with about 8 nodulous spiral cords ....loxospira
.. Body whorl with a spiral row of nodules on each side of fasciole.rudis
.. Body whorl with axial ribs ....excentrica
. Shell uniform turrited or biconic
.. Axial sculpture faint or wanting
... Sutural band with a smooth carina
.... Shell uniformly black or dark brown
..... Body whorl with a row of nodules and 2 rows of granules..aterrima
(con.)

..... Body whorl with many rows of nodules.......... cerithoidea
..... Body whorl with 4 or 5 spiral cords, upper one undulated and uniform black .... grandimaculata
..... Body whorl with elongated peripheral nodes and 8 cords. fonseca
.... Shell dark with a subtranslucent band above the nodules.melchersi
.... Shell dark, raised sculpture banded white or yellow
..... Body whorl with a keel and 3 rows of granules ...collaris
..... Body whorl with 2 dark and 2 light keels ......zonulata
..... Periphery with sharp tubercles, base with distant spirals.albonodosa
..... Body whorl with about 12 spiral cords, peripheral ones paired.nephele
.... Shell yellow
..... Spire with a fine beaded cord between 2 rounded keels. cincta
.. Axial sculpture faint or wanting
... Sutural band weakly lobed or granular carina
.... Shell uniformly black ....montereyensis
.... Shell marbled with brown and white ....amathea
.... Shell dark, the raised sculpture banded yellow or white
..... Periphery with 2 rows of nodes ....aureonodosa
..... Periphery with a single row of elongate nodes
...... Peripheral nodules 16 ....monilifera
...... Peripheral nodeales 12 ....nymphia
.. Axial sculpture distinct
... Sutural band with several small spiral cords
.... Shell uniformly livid purple .... tepocana
.... Shell dark with paler spots or bands
..... Last whorl with about 14 spiral cords .... rugitecta
..... Body whorl with 6 tuberculate spiral cords ....trimariana
... Sutural with a weakly lobed or granular carina ... incrassata
... Sutural band with a smooth keel
.... Shell uniformly dark brown or blackish
..... Axial ribs 6 .... bridgesi
..... Axial ribs 8 or 10
...... Spiral sculpture granulated .... granulata
...... Spiral sculpture distinct on the base only..... rustica
..... Axial ribs 12 or more
...... Axial ribs distinct on the periphery only
.... Axial ribs oblique, sharp .... caelata
.... Axial ribs vertical, fine .... discors
.. Axial sculpture distinct
... Sutural band with a smooth keel
.... Shell uniformly dark brown or blackish
..... Axial ribs 12 or more
...... Axial ribs extending over the base
.... Entire surface finely spirally striate .... hanleyi
.... Ribs small, numerous, somewhat numerous ....callosa
.... Spire with 3, body whorl with 21 spiral cords ... solitaria
.... Spire with 4, body whorl with 15 spiral cords ...hermanita
.... Shell with the raised sculpture banded yellow or white
..... Axial ribs 8 to 10
...... Spiral striations only axial ribs with 2 basal nodules.flavonodosa
...... Spire with fine spiral striae, 3 cords on the base ..eurynome
...... Spire with 2, body whorl with 7 spiral cords ....bacchia

(con.)

..... Axial ribs 12 or more
...... Posteriorly with irregular tuberculate spiral cords ..appressa
...... Spire with 3, body whorl with 10 tuberculate spiral cords. bicolor
... Sutural band nodulous
.... Shell uniformly dark brown or black
..... Axial ribs 8 to 10 .... unicolor
..... Axial ribs 14 or more
...... Body whorl with fine spiral striae only ......erebus
...... Body whorl with strong spiral cords
.... Ribs fading out below the periphery .... martinensis
.... Ribs reaching the canal ....sowerbyi
.... Shell dark with the raised sculpture banded with white
..... Axial ribs 12, base with 4 tuberculate spiral cords ... pluto
..... Axial ribs 14 or more
...... Ribs showing as double or triple nodes on the shoulder..arsinoe
...... Spire finely spirally striate, 4 low cords on base ..adamsiana

thiaella Kiener, tomliniana Melvill, atramentosa E.A. Smith, bottae Val., flavicarinata E.A. Smith, (micans Hinds = Clathurella).

Genus Clavus con.
Whorls without a sutural band ....(Brachytoma)
. Spiral sculpture of strong cords
.. Shell with a short spire and moderate canal
... More or less nodulous spiral cords on the spire
.... Spire with 1, body whorl with 6 spiral cords ..trimariana
.... Spire with 3, body whorl with 4 or 5 spiral cords ..candace
.... Spire with 3, body whorl with 8 spiral cords ......dirce-
grandimaculata see Crassispira
... Nodulous spiral cords confined to the base
.... Axial sculpture of 9 oval nodes ....eurynome
.... Axial sculpture of 7 or 8 short ribs .... erigone
.... Axial sculpture of 12 ribs .... abdera

Genus Clavus
Axial sculpture of ribs extending from suture to suture
. Spiral sculpture confined to the canal
.. Axial ribs nearly continuous up the spire
... Axial ribs 8 or 9 pinkish white, polished
8 x 3 mm. Gulf of Calif. ....lalage
Proc. 56, p 7, pl.20, fig. 3
... Axial ribs 10 to 11
.... White, polished 9 x 3.5 mm. Panama Bay ,51 fms. ... hespera
Proc. 56, p. 6, pl.20, fig.2
.... Light brown,brilliantly polished 9.5 x 4 mm
Head of Gulf of California -.................. palmeri
Proc. 56, p.9, pl.19, fig.7
.... Pinkish white or flesh color, polished
14 x 6 mm. Panama Bay, 153 fms. .... plicatella
Bull. Mus. Comp. Zool 43-289; Proc. 56, pl.20, fig.4
.. Axial ribs not continuous over the suture
... Axial ribs 8 to 9 7 x 2.5 mm. Panama Bay,51f....... elissa
Proc. 56, p.6, pl.20, fig.4

... Axial ribs 12-14
.... White base yellowish 14.2 x 5 mm. Pt. San Firmin,L.C...ferminiana
Proc. 56:7 pl.8:4
.... Yellowish, a dark spot on back of body whorl- 14 x 5 mm
Acapulco to Central America .... pudica
... Axial ribs 14
.... White,polished 8.5 x 3 mm near Mazatlan...........attalia
Proc. 56:10 pl.18:7
. Spiral sculpture confined to the spaces between the ribs
.. Close incised spiral lines on lower part of body whorl
... Brownish,polished. 6.5 x 2.25 mm. Todos Santos Bay ..hemphilli
Oldroyd vol.2, pl.69
.. 6 to 7 incised spiral lines on body whorl followed by 3 cords
... Brownish,glistening, ribs lighter 13.7 x 5 mm Scammons Lag.. arbela
Proc. 56:10, pl.4:3
.. 10 to 11 incised spiral lines on last whorl
... Pinkish brown,brilliantly polished- 7 x 2.5 mm. Gulf Calif...aeolia
Proc. 56:11,pl.3,fig.1
11 mm. Papagayo .... quisqualis
. Spiral sculpture crossing the axial ribs
.. Spiral lines or threads between the sutures 3 .....(Clathrodrillia)
... Intersection of axial and spiral sculpture slightly nodulous
....White 10 x 4.5 mm Cape San Martin, 218 fms. ......castianira
Proc. 56:15, pl.2 :1
... Intersection of axial and spiral sculpture strongly nodulous
.... Whitish with a brown periostracum 16.5 x 8.6 mm La Paz..andromeda
Proc. 56:16, pl.2:2
.. Spiral lines between the sutures 4 to 6
... Axial ribs 7
.... Pale pinkish brown 23.5 x 7.3 mm Gulf of Calif. ...pilsbryi
Lowe p 23, pl.4, fig.2
... Axial ribs 10 to 14
.... Fasciole narrow, slightly contracted
..... Ribs narrow, shap edged
...... Whitish 16 x 6 mm. Gulf of Cal if. ....aerope
Proc. 56:13, pl.1, fig.3
..... Ribs wide, strong
...... White, polished, with touches of brown 17 x 6.5 mm
Gulf of Calif. ....ianthe
Proc. 56:9, pl.4:6
.... Fasciole strongly constricted
..... Shell pale olivaceous 13 x 5 mm. Gulf of Calif. ....paziana
Proc. 56:14, pl.5:1
..... Shell whitish or gray 22 x 8 mm Acapulco to Panama..pallida
... Axial ribs 13
.... Purplish brown with a yellowish white glaze 18 x 6 mm
Proc.56:11,pl.4 San Pedro ....halocydne
... Axial ribs about 35
.... Warm yellow brown 7 x 3.5 mm. Gulf of Calif. .... limans
Proc. 56:14, pl.13:3
.. Spiral lines 10
... Flesh color, periphery with pinkish spots on the ribs
Lowe p.23, pl.4,fig.1 17 x 7 mm Gulf of Calif. ....acapulcana

.. Entire surface with fine spiral threads
... Rosaceous 11 x 4.5 mm. Gulf of Calif. Proc.56:9,pl.120:9..hucuba
Axial sculpture of axially elongated nodes at the periphery .. (Elaeocyma)
. Peripheral nodes 8
.. Base with smooth spiral cords
... Porcelain white, back of last whorl brown 50 x mm Gulf of Cal..unimaculata
.. Base with 4 spiral rows of nodes
... Dull waxen, darker behind the aperture- 15 x 6 mm - Panama Bay
Proc. 56:;2. pl. 4:5 .....abdera
. Peripheral nodes 10 to 11
.. Yellowish, later whorls brownish with a pale per ipheral band
31 x 10 mm. San Pedro to San Diego Proc. 56:,pl.4 fig.1..empyrosa
.. Brownish, paler on the upper whorls 13x4.8 mm Gulf of Calif .
Proc. 56:12, pl.4:2 ..... aegina
. Peripheral nodes 13
.. Cream color, nodes brownish 49 x 17.3 mm. Gulf Calif... pembertoni
Lowe p. 22, pl.3; fig.6
Spiral sculpture of strong cords crossing the low axial ribs
. Whorls angulated with one or more peripheral ....(Carinodrillia)
.. With a single cord between the sutural cords
... Surface with microscopic spiral striae- yellowish white-
20 x 7 mm La Paz ...Proc.56:17,pl.5:4...........halia
... Surface smooth 14 x 5 mm. Guaymas. Pyl. p.45,pl.2,f.4.... soror
.. With two peripheral cords
... Lower peripheral cord the strongest
.... Base with 12 spiral threads, last whorl keeled- Pale greenish brown
30 x 8 mm. Proc.56:18,pl.5:6 Gulf of Calif..... alcestis
.... Last whorl with 8 cords, followed by spiral threads
..... Fasciole wide, smooth Pale brown 27 x 8 mm Gulf Calif...haliplexa
Proc. 56:19, pl.5, fig.5
..... Fasciole axially threaded Fawn colored 15 x 5.1 mm. Acapulco to
Manzanillo. P & L p.45, pl.2, fig.3 ....jacula
... Upper peripheral cord the stronger
.... Pale brownish, clouded on a yellowish ground 30 x 8 mm
Proc. 56:18, pl.5:3 Gulf of Calif. ....thestia
... Peripheral cords equal, close spaced. Acapulco tp Panama..duplicata
.. With two major and two minor spiral cords on the spire. Cinnamon brown,
summit of ribs whitish. 17 x 5.6 mm. Pyl 45,pl2,f.2. Manzanillo ..adonis
.. With three woal cords on the spire. Grayish white above the periphery
brown below 14.4 x 5.4 Manzanillo. P&L p.46,pl.2,f.5 ..dichroa
. Whorls not angulated, spire with 4 or 5 cords
.. Base with 10 spiral cords 13 x 5 mm Pro.56:14,pl.5:1. La Paz..paziana
. Whorls shouldered
.. Base with 15 spiral cords 18 x 6.6 mm P&L 44,pl2,f.1 Acapulco.nutica
.. Last whorl with 25 spiral cords. Pale brownish. 16 x 5.5 mm.
Proc. 56:16, pl.5:2 Lower Calif. ....callianira

aenone Dall, Proc. 56, p.15, no fig., Gulf of Calif.
alcmene Dall, Proc. 56, p. 19, no fig. Acapulco
alocyne Dall, Proc. 56, pl.2, fig.3, Gulf of Calif.
albicostata Sby., Rve. 8, fig.62, Galapagos
clavata Sby., Rve. pl.15, fig.132, West Colombia
rosea Sby., Rve fig.43, Central America
rugifera Sby. Rve pl.15, fig.127
splendidula Sby. Rve. pl.8, fig.60, Galapagos
sculpta Hinds, Rve. pl.18, fig.154, Panama.

Genus Clavus (Crassispira)

Axial sculpture of strong growth lines only
. Two spiral cords on the spire, five on the body whorl Crassispirella
Dark brown, cords lighter 23.5 x 8.5 mm. Panama......dirce
Proc.56:22,pl.6:3. = grandimaculata C.B.Adms. fife Lowe
Axial sculpture of elongate nodes on the body whorl
. Fasciole separated from the suture by a thread
.. A peripheral series of nodes, 3 smaller on base Crassispirella
Dark brown, with a whitish peripheral band 10 x 3 mm.
Proc. 56:21, pl.7:5. Acapulco .... eurynome
.. Eight peripheral tubercles, rest of sculpture faint. Black, tubercles
lighter. Maz. Cat. # 466 12.5 x 4.25 mm. Mazatlan .. albonodosa
. Fasciole separated from the suture by a smooth cord
.. A nodulous cord on the periphery, 5 on the base. Dark, the cords yellowish
P&L, p.52, pl.3, f.3. 12 x 4.5 Nicaragua ....loxospira
.. Two cords on the periphery, 7 on the base. Slate gray with yellowish projections. Proc. 56:25,pl;6,f.1. 14.5 x 5.5 La Paz ... bacchia
.. Two nodulous cords on the periphery, 10 on the base. Black, projecting
sculpture yellow. Proc.56:23,pl.7,f.1. 13x5mm Panama ... nephele
.. Eight equal cords on spire and base. Uniformly black. 15.7x 6 mm.
P&L p 50,pl.13,fig.11 Gulf of Fonseca .... fonseca
.. Nodulously keeled on the periphery, a few spirals on base. Very dark
chocolate. 15 x mm Reeve pl.12,f.100 Gulf of Calif. to Ecuador
Brachytoma .. aterrima
.. Similar, many nodulous spirals on base. Brachytoma.
16 x 6.5 mm. Mazatlan. Maz. Cat. #462 .... cerithoidea
.. A peripheral row of granules, similar rows on the base. Black, granules
and keel yellow. Rve. pl.15,f.120. Ecuador .... collaris
.. A single row of small tubercles, faint on body whorl. Uniformly black.
Rve. pl.18, f.149. 15 x 6 mm. Magdalena Bay to Peru ... luctuosa
. Fasciole separated from the suture by a lobed or waved cord
.. A tuberculate peripheral cord; 5 cords on base. Black with projecting
sculpture orange. Maz. Cat. #464. 16 x 5.75mm. Gulf of Calif. to
Panama .... monilifera
. Fasciole separated from the suture by a nodulous cord.
.. A peripheral row of tubercles, five cords on base. Tea green with orange.
P&L p.51, pl.10,f.11. 17 x 6.2 mm. La Paz .... nymphia
.. Periphery with two beaded cords. Black, cords yellow
Reeve p. 16 fig.39. Echador .... zonulata
Axial sculpture on body whorl of short ribs
. Fasciole separated from the suture by a fine thread
.. Entire surface with fine spiral striae. Dark purple brownish, ribs whitish
Oldroyd v.2, pl.1, p.77. 17x6mm. Monterey. Crassispirella. ..montereyensis
.. Fine spiral threads above the periphery, nodose cords on the base. Olive
brown, aperture purplish. Proc.56:21,pl.7:8.20x9mm Panama ..erigone
.. Nine equal spirals above the periphery, 16 on the base. Livid purple under
the olivaceous epidermis. Proc.56:25,pl.16:5.19x8mm Cape Tepoca. tepocana
.. Series of nodes on periphery,5 cords on base. Black with nodes yellowish.
P&L p.52, pl.3:4. 11x4mm Tres Marias Islands ....trimariana
.. Two peripheral cords , 2-3 on base. Pale purple with touches of brown.
Proc.56:22,pl.16:6.7x2mm Gulf of Calif. Crassispirella candace
.. Two or 3 peripheral cords,5 on base. Black or very dark brown. 9x3.5 mm.
Proc. 56:24,pl.17:4. Panama Bay ....epicasta

•• Ribs small, numerous , and somewhat obsolete. Brownish... callosa (Rve.12:104

• Fasciole separated from the suture by a rugose band

•• Spiral sculpture absent, 2 series of basal tubercles. Black, ribs and tubercles yellow,fasciole bluish. 11.2x5.2mm Corinto. flavenodosa(P&L p.51)

•• Ribs crossed by very finely granulated lines. Light brown. Crassispirella Reeve pl.11, fig.90. Panama ....granulosa

• Fasciole separated from the suture by a smooth cord

•• Two peripheral cords, 4 on base. Grayish(probably bleached). 11x5mm Proc.56:24,pl.7:7. Panama Crassispirella ...bridgesi

•• About 15 spiral cords on the body whorl. Dull brownish black. Crassispirella 9.3x3.4 mm. P&L, p.53, pl.3, fig.6. Acapulco ....hermanita

•• About 20 spiral cords on the body whorl. Brownish black. Crassispirella. P&L, p.53, pl.3:5. 13x6.2mm. Mazatlan ....solitaria

•• With a prominent hump or varax. Blackish brown. Brachytoma Reeve pl.6:38. Panama ....discors (atramenttosa)

•• Entire surface finely spirally striated. Black,epidermis blackish brown. 9.5 x 3.75 mm. Mazatlan . Maz. Cat. #468 ....hanleyi

•• Strong spiral cords on the base. Dark chestnut or chocolate. 50 x mm Kiener p.33. Gulf of Calif. to Peru ....bottae ss

•• Ribs numerous, sharp. Brownish black. Gulf Calif. to Ecuador..rustica(Rve.pl:91

• Fasciole separated from the suture by 4-5 cords.

•• Body whorl with about 14 spiral cords. Dark reddish brown with a pale peripheral band. 30.5 x 10 mm. Proc. 56. San Bartolome Bay. rugitecta

• Fasciole separated from the suture by a waved or lobed cord.

•• One peripheral series of nodes, 3 on base. Marbled with brown and white. Proc.56:27,pl.6:2. 22x8mm. Acapulco. Crassispirella. amathea (?)

•• Two peripheral cords, 3 on base. Black with a peripheral series of orange tubercles. P&L p.50,pl.3:2. 10.6x4.7mm. Acapulco ......aureonodosa

•• Ribs grained and crossed by raised lines. Blackish. 40mm. Panama. Reeve pl.9, fig.76. ....incrassata ss

•• Ribs transversely ridged. Brown. Rve. pl.7:58. Galapagos..excentricus

• Fasciole separated from the suture by a nodose cord

•• Entire surface with fine, equal spiral striae. Brownish black. 24.2x9mm. P&L p.49, pl.2:10. Corinto .... erebus ss

•• Body whorl with fine striae, a few larger. Dark reddish, ribs paler. 7.5 x 3 mm. Cape San Lucas ..... Crassispirella .. appressa

•• Body whorl with about 15 small cords. Black with lighter spots on summit of ribs. P&L p.48,pl.2:11. 30.3x13.2mm. Panama........adamsiana ss

•• Body whorl with 12 rounded spiral cords (brownish). Crassispirella Proc. 56:27, pl.13:4. 18x8mm Cape San Martin,Gulf of Calif.. martensis (?)

•• Two or 3 peripheral cords, 4 or 5 on base. Dark brown with paler projections. Proc.56:26,pl.6. 17x7.5mm. Bartolome Bay. Crassispirella arsinoe

•• One spiral cord on the periphery, 4 on base. Black with an interrupted yellow band. P&L,p.49,pl.2:12. 18.6x6.8mm Gulf of Calif. ... pluto

•• Entire surface minutely spirally striated,2 prominent on base. A narrow horn colored band above the tubercles. 18x6mm. Maz. Cat.#461. Brachytoma Gulf of Calif. to Panama ....melchersi

•• Whorls tuberculate, ribs crossed by coarse lines. Chocolate brown with a white band above the periphery. 30mm. Reeve pl.7,f.50. Drassispirella Gulf of Calif. to Peru ....rudis

•• Ribs decussated.Brown,aperture blackish purple. Rve.errata fig.49 Central America ....sowerbyi

•• Spiral sculpture absent.Pale brownish black. Panama. Rve.pl.11:92. unicolor

•• Ribs tuberculated. Blackish brown,ribs yellow. 20mm.Panama..bicolor. Rve.6:40)

Genus Clathurella

Notch armored
. Outer lip thickened and dentate in the adult
.. Axial ribs indistinct on the body whorl
... Whorls angulated, with a spiral keel on the angle.
.... Spiral keel prominent..............................crystallina
.... Spiral keel not prominent.........................canfieldi
... Whorls not angulated
.... Spire with from 2 to 4 major spiral cords
..... Intersections of axial ribs and spiral cords nodulous.
...... Axial ribs nearly vertical....................... adana
...... Axial ribs protracrively oblique .... adria
..... Intersection of axial ribs and spiral cords not nodulous..cymodoce
.....conradiana
.... Spire with 5 or 6 spiral cords ....thalassoma
.. Axial ribs strong, reaching to the canal
... Spiral sculpture confined to the base
.... Axial ribs 12, spiral threads 13 ....partefilosa
.............candida
... Spiral sculpture on all whorls
.... Canal distinct
..... Axial ribs 9 ....sirena
..... Axial ribs 12 to 14 ....immaculata
.... Canal very short
..... Sculpture deeply pitted, axial ribs sharp ....trichodes
..... Sculpture not pitted, axial ribs rounded. .... rava
.... affinis

Genus Mangelia

Notch obsolete at all stages, shell biconic ....(Mitromorpha)
. Axial sculpture absent ....filosa
. Axial sculpture on early whorls only ....gracilior
. Axial sculpture present on all whorls
.. 2 or 3 spirals on spire,6 or 7 on body whorl
... Aperture about $\frac{1}{2}$ length of shell .... crassaspera
... Aperture about one third length of shell ....rhyssa
.. 2 or 3 spirals on spire, 10 on body whorl ....aspera
.. 4 to 6 spirals on spire, about 22 on body whorl ..... interfossa
Notch shallow, rounded in the adult
. Ribs closer, more irregular ....(Bela)
.. Whorls rounded or slightly shouldered
... Entire surface with fine spiral striae
.... Axial ribs 9 to 12
..... Spiral striae on spire about 10 .... variegata
..... Spiral striae nearly obsolete, shell glossy ... pulchrior (nitens)
..... Spiral striae crowded, indistinct.................striosa
.... Axial ribs 15 or more
..... Shell white, with 2 darker spiral lines .... oenoa
..... Shell pale lead color, with horn colored bands ...plumbea
... Spiral sculpture of grooves showing between the ribs
....Shell uniformly dark reddish brown .... interlirata
.... Shell white, with widely spaced brown lines......... cesta
... Spiral sculpture of small raised cords
.... Axial ribs about 12 .... bella
.... Axial ribs about 15 ....oetolaca

(con.)

.. Whorls obtuse angulated
... Axial ribs 7 or 8
.... Spiral striae distinct, flattened .... cymatia
.... Spiral striae rather indistinct ....antiochroa
... Axial ribs 10 to 12
.... Spiral sculpture of fine, equal striae .... hecetae
.... Spiral sculpture fine more or less alternating ..... danae
.... Body whorl with about 12 spiral threads ....cyrene
... Axial ribs 15 or more
.... Spiral sculpture fine,uniform .... beta
.... Spiral sculpture nearly obsolete ....densilineata
.... Spiral sculpture of flattened threads .... crebricostata
.. Whorls sharply angulated with a cord on the angle
... Axial ribs about 7 ....antiprygus
... Axial ribs 9 or 10
.... Body whorl with 10 major spiral cords .... arteaga
.... Body whorl with 7 major spiral cords .... roperi
Notch deep, slit-like
. Axial ribs wave-like, spiral sculpture fine ....(Agathotoma)
.. Axial ribs 5 or 6
... Spiral sculpture absent or microscopic............. camarina
... Spiral sculpture on spire fading out on base ......taeniornata
... Spiral sculpture of numerous grooves
.... Shell purple brown, banded with white............. aculea
.... Shell horn yellow..................................pecata
... Spiral sculpture of numerous equal threads .... penelope
... Spiral sculpture of somewhat unequal threads
.... Axial ribs irregular, more numerous toward the apex.. hastula
.... Axial ribs sharp, vertical......................... aethra
... Spiral sculpture with every 3rd or 4th thread larger... finitima
.. Axial ribs 7 or 8
... Spiral sculpture absent or microscopic .... hippolita
... Spiral sculpture of a median and several anterior threads.. neglecta
... Spiral theeads on the anterior half of whorls stronger... niobe
... Spiral sculpture on body whorl of 4 strong threads ... phaethusa
... Spiral sculpture on body whorl of 7 obscure threads .... helena
... Spiral sculpture of fine, equal threads
.... Whorls shouldered
..... Shell fusiform, short, stout .... phryne
..... Shell subcylindrical, turrited ....euryclea
..... Shell slender, acute ....aegialea
.... Whorls not shouldered...
..... Shell stout, blunt, white, brown banded ....quadriseriata
..... Shell slender, waxen white ....melita
.. Axial ribs 10 or more
... Spiral sculpture of fine, equal threads
.... Shell subdiaphanous, tinted reddish brown .... subdiaphana
.... Shell pinkish with cinnamon axial dashes .... carissima
... Spiral sculpture of 12 grooves on base and canal ...... pyrrhula
... Spiral sculpture fine, with 3 or 5 major cords
.... Intersection of major cords and ribs nodulous ....telemon
.... Intersection of major cords and ribs swollen .... louisa
.... Intersection of major cords and ribs smooth.............scammoni

The following are species listed by Mr. A.M. Strong in his notebook.

Genus Turricula

T. (Turricula) arcuata Reeve ' Veragus. Reeve 3, fig.15
T.(Turricula) libya Dall. Type loc. Cape San Lucas. Proc. USNM 56:2,pl.2:5
T. (Turricula) maculosa Sowerby. West Colombia. Reeve pl.6,fig.45
T. (Turricula) maura Sowerby Guayaquil. Reeve pl.6:47. in Knefastia.
T. (Turricula) nigricans Dall. Lower Calif. Proc. 56:3, pl.2:6
T. (Pleurofusia) armilda Dall. Cape Lobos, Gulf Calif. Bull. Mus. C.Z. 43:262
T. (Pleurofusia) dolenta Dall. Gulf of Panama. Bull. Mus. C.Z. 43:262
T. (Pleurofusia) fusinella Dall. Panama & Cape Lobos. Bull. Mus. C.Z. 43:261
Clavus militaris Hinds. Veragua. Reeve pl.7,fig.55
T. (Turricula) lavina Dall. West Mex. Proc. 56:4, pl.1:6.

Genus Surculites

S. (Megasurcula) carpenterianus Gabb. T.L. fossil. Grant and Gale p.498
var. tryonianus Gabb Fossil. Grant and Gale, p. 499
var. tremperianus Dall San Pedro. Grant and Gale,p. 499
S. (Megasurcula) remondii Fossil. Grant & Gale, p. 495
stearnsianus Raymond San Diego. Nautilus 20:38, fig. pl.2:4-6

Genus Turris

T. (Turris) nobilis Hinds. San Blas. Voy. Sulphur, pl.5, fig.1-2.
albicarinata Sowerby vide Tryon. Panama. PZS 1870, p.253
T. (Turris) oxytropis Sowerby. Panama . Reeve pl.3,fig.17
T. (Turris) picta (Beck) Reeve. Reeve pl.3, fig.16.
T. (Gemmula) gemmata Hinds. Magdalena Bay. Reeve, pl.10,fig.83
T/ (?) rombergii Morch. Realejos. Jr. de Conch. vol.6,1857,p.284,pl.10:8

Genus Ancistrosyrinx

A. cedo-nulli Reeve. Panama. Reeve pl.14, fig.117 .

Genus Leucosyrinx

L. (Aforia) persimilis Dall. Panama. in 1620 fms. Bull. MCZ p.271,pl.12:2
var. leonis Dall. Coast of Wash. in 877 fms. Bull. MCZ 43:272
L. (Stiraxis) argeta Dall. Galapagos in 812 fms. Bull. MCZ 43:283,pl.19:8
L. (Stiraxis) aulacea Dall. Acapulco in 1879 f. Bull MCZ 43:273,pl.2:5
L. (Stiraxis) castanea Dall. Galapagos in 1322 f. Bull. MCZ 43:284,pl.1:1
L. (Storiaxis) cingulata Dall. Ecuador in 741 f. Bull. MCZ 43:283,pl.19:6
L. (Stoiraxis) clarinda Dall. Panama in 1772 f. Bull. MCZ 43:285,pl.1:3
L. (Surculina) blanda Dall. Cocos Id. in 1067 f. Bull. MCZ 43:291,pl.3:1
L. (Surculina) galapagana Dall. Galapagos in 634 f. Proc. 56:5, pl.3 :2.
L. (?) clionella Dall. Panama. in 510 f. Bull. MCZ 43:270, pl.14:3
L. (?) parolla Dall. Ecuador in 1132 f. Bull. MCZ 43:282, pl.14:4
L. (?Surculina) hermione Dall. Galapagos 812f. Proc. 56:70, pl.19:6

Genus Pleurotomoides

P. calypso Dall. San Diego 822 f. Proc. 56:31, pl.9:8
P. dinera Dall. Galapagos 812 f. Bull. MCZ 43:281
P. erosina Dall. Panama 1672 f. Bull. MCZ 43:269, pl.2:1
P. esilda Dall. Panama 730 f. Bull. MCZ 43:282
P. esurians Dall. Panama 1270 f. Bull. MCZ 43:265
var. pernodata Dall Tehauntepec 2232f. Bull. MCZ 43:266
P. exulans Dall. Ecuador 1132 f. Bull. MCZ 43:265,pl.13:5
P. herilda Dall. Panama 1672 f. Bull. MCZ 43:266
P. isogonia Dall. Panama 1020 f. Bull. MCZ 43:279, pl.4:3
P. oceanida Dall. Panama 1270 f. Proc. 56:51, pl.3:5
P. sedillina Dall. Panama 1270 f Bull. MCZ 43:287,pl.13:8
P. xylona Dall. Galapagos 1360 f. Bull. MCZ 43:280,pl.2:3
? P. eurybia Dall. Cape San Quentin.359f. Proc.56:72,pl.22:2

Genus Lora
Lora brachis Dall. Galapagos 822 f. Proc. 56:41, pl.7:3
Lora elegans Mollêr. Norwegian Coast. Tryon vol.6:210. pl.28:50
sixta Dall. San Diego 640 f. Proc. 56:50,pl.16:2.
Lora halitropa Dall. Magellan Straits 61 f. Proc. 56:40, pl.16:6.
Lora krausi Dall/.Port Etches, Alaska. Proc. 56:46, pl.15:3
lotta Dall. Queen Charlotte Ids. to San Diego. Pr.56:47,pl.14:4
Lora levidensis Cpr. Vancouver to San Diego. Proc. 56, pl.21:1
Lora reticulata Brown. Scotland. Reeve,pl.19,fig.159.
pitysa Dall. Pt. Pinos to San Diego. Proc. 56:40,pl.16:7
diegensis Dall. San Diego 112 f. Proc. 56:46, pl.16:10
Lora subulata Gould. Ecuador. Tryon vol.6, pl.32. p.1222, fig.18
cunninghami Smith Patagonia
equatorialis Dall. Ecuador 401 f. Proc. 56:44, pl.13:2.
Genus Daphnella
D. allemani Bartsch. Panama Bay Proc. 79,art.15, p.3.
D. bartschi Dall. Lower Calif. to Gulf. Proc.56:74,pl.19:4-5.
D. clathrata Gabb. Catalina. Oldroyd vol.2,p.150
D. mazatlanica P. & L. Mazatlan. Pr. Ac. Nat. Sci. Phila. vol.84:61,pl.4:7
D. panamica P&L Taboga Id. Pr. Ac. Nat. Sci. vol.84:60, pl.4:6
Genus Zetekia
Zetekia denticulata Dall. Panama. Proc. 56:73, pl.1:1.
Genus Borsonia
B. bartschi Arnold. Fossil. San Pedro. Pal. S.P., p.200, pl.9:1.
nicoli Dall. San Nicolas Id. 158 f. Proc. 56:39, pl.12:1.
B. callicosta Dall. Acapulco 660 f. Proc. 24:515, vol.66, pl.21:10.
B. nychia Dall. Point Loma. 101 f. Proc. 56:38, pl. 12:2
Genus Spirotropis
S. (Spirotropis) adrastia Dall. Monterey 581 f Proc.56:33, pl.19:2
S. (Spirotropis) agameda Dall. Cape San Quentin 539 f. Proc. 56:33,pl.24:2
S. (Spirotropis) chrysothemis Dall. Catalina 704 f. Proc.56:31,pl.11:2
S.(Spirotropis) cymothoe Dall. San Diego 822 f. Proc. 56:31, pl.9:3
S. (Spirotropis) evande Dall. (in Mangelia) Sta Rosa Id. 53f. 56:69,pl.23:2
S. (Spirotropis) polycasta Dall. Tillamook Bay 786 f. Proc. 56:30,pl.9:4-7
S. (Pythlomangilia) herminea Dall. Catalina 600 f. Proc. 56:50, pl.3:6
S. (Pythlomangilia) renaudi Arnold. Fossil.
amycus Dall. Monterey 581 f. Proc.56, pl.11:5. (in Antiplanes).
S. (Pythlomangilia) rhodope Dall. Sta. Rosa Id 82f. Proc.56:39,pl.12:5
S. (Borsonella) abarbarea Dall. Sta. Rosa Id. 55f Pr. 56:35,pl.9:5.(Antiplanes
S. (Borsonella) agassizi Dall. Panama 1471 f Bull MCZ 43:275,pl.1:5.
S. (Borsonella) agonia Dall. Galapagos 643 f. Bull. MCZ 43:278,pl.1:6
var. altina Dall. Panama 1010 f. Bul'. MCZ 43:278, pl.14:9
S. (Borsonella) barbarensis Dall. Sta. Barbara Id. 302-614f. 56:37,pl.12:6
dalli (Arnold) Dall. Cortez Bank 39f. Bull MCZ 43:275,pl.13:9
S. (Borsonella) coronadoi Dall. Coronado Ids. 39f. Bull. MCZ 43:277,pl.14:2
dalli Arnold (not V & S.) Type loc. fossil
angelana Hanna. New name for dalli Arnold.
S. (Borsonella) diegensis Dall. San Diego 822 f. Bull. MCZ 43:275,pl.13:11
S. (Borsonella) egregia Dall. Peru 2222 f. Bull. MCZ 43:279
S. (Borsonella) encella Dall. Cocos Id. 1067 f. Bull. MCZ 43:287,pl.14:11
S. (Borsonella) hooveri Arnold. Fossil. Rec. Gulf to Ecuador. Mus. MCZ 43:276
S. (Borsonella) emphale Dall. Pt. Loma 78 f. Pr. 56:38, pl.12:4
S. (Borsonella) saccoi Dall. Panama Bay. Bull. MCZ 43:277, ~~pl~~. 322 f.
S. (Borsonella) suffusa Dall. Galapagos 634 f. 43:282,pl.14:10.

S. (Antiplanes) amphitrita Dall. Sta. Barbara Id. 638f. Proc.56:37, pl.9:1
S. (Antiplanes) antigone Dall. San Diego 822 f. Proc. 56:52,pl.11:4
S. (Antiplanes) pedroana Arhold. Fossil. Grant & Gale p. 556,pl.26:32-33
hyperia Dall. Drakes Bay. Proc. 56:35, pl.9:6
S. (Antiplanes) perversa Gabb. Fossil. Grant & Gale p. 553
catalinae Raymond. Catalina 125 f. Oldroyd vol.1, pt. 1, p.83
S. (Antiplanes) rotula Dall/ New name.
smithi Arnold (not Forbes). Fossil. Rec. Forrester Id,Alaska/
S. (Antiplanes) santarosana Dall. Sta. Rosa Id. 53f. Proc.56:pl.11:3
S. (Antiplanes) thalea Dall. San Luis Obispo 252 f.
S. (Antiplanes) voyi Gabb. Fossil. Grant & Gale p. 255
vinosa Dall. Alaska. Proc. 24:, pl.24:1.
Genus Pseudomelatoma
P. moesta Cpr. Sta, Barbara. See vol.6:183
P, penicillata Cpr. Cerros Id. Grant & Gale p.560,pl26:5. Nautilus 52:22
P. torosa Cpr. Monterey. Grant & Gale p.562, pl.26:20.
P. aurantica Cpr. San Diego. (color form of moesta)
P. digna E.A. Smith. California. Ann. Mag. Hist. vol.19:499
P.(Laevitectum) eburnea Cpr. Gulf Calif. Proc. 56:19, pl.13:5.
Genus Clavus
C. (Clavus) unimaculata Sby. Central Amer. Grnt. & Gle. p.575,pl.26:2
C. (Clavus) pembertoni Lowe. Angels Bay,Gulf. Trans. San Diego vol.8:22.
Group of hemphilli
C. (Cymatosyrinx) hemphilli Stearns. Todos Stos. B. Grnt.&Gale p.577,pl.26
C. (Cymatosyrinx) aeolia Dall. Cape Tepoca. Proc.56:11, pl.3:1
C. (Cymatosyrinx) arbela Dall. Scammons Lagoon. Proc. 56:10, pl.4:3.
C. (Cymatosyrinx) attalia Dall. Mazatlan. Proc. 56:10, pl.18:7.
C. (Cymatosyrinx) ferminiana Dall. Pt. San Fermin. Proc.56:7,pl.8:4
C. (Cymatosyrinx) palmeri Dall. Head Gulf Calif. Proc.56:8,pl.19:7
C. (Cymatosyrinx) plicatella Dall. Panama. Proc. 56:7, pl.20:4
Group of pallida
C. (Cymatosyrinx) pallida Sby. Panama. Grnt. Gale. p. 576, pl.26, f.16-17
C. (Cymatosyrinx) aegina Dall. Agua Verde Bay. Proc. 56:12,pl.4:2
C. (Cymatosyrinx) halocydne Dall. San Pedro. Proc. 56:11, pl.4:4
C. (Cymatosyrinx) ianthe Dall. Cape Tepoca. Proc. 56:9,pl.4:6
hucaba Dall. Gulf. Calif. Proc. 56:9, pl.20:9.
C. (Cymatosyrinx) johnsoni Arnold. Fossil.
C. (Cymatosyrinx) paziana Dall. La Paz. Proc. 56:14, pl.5:1.
Group of elissa
C. (Cymatosyrinx) elissa Dall. Panama. Proc. 56:6, pl.20:1
C. (Cymatosyrinx) hespera Dall. Panama. Proc. 56:, pl.20:2.
C. (Cymatosyrinx) lalage Dall. Gulf Calif. Proc. 56:7,pl.20;3
Ungrouped species.
C. (Cymatosyrinx) aerope Dall. Agua Verde Bay. Proc.56:13, pl.1:3
C. (Cymatosyrinx) acapulcana Lowe. Acapulco. Tr. San Diego Soc. 8:23,pl.4:1
C. (Cymatosyrinx) albicostata Sby. Galapagos. Reeve pl.8:62.
C. (Cymatosyrinx) alemene Dall. Agua Verde Bay. Proc. 56:19.
C. (Cymatosyrinx) clavata Sby. West Colombia. Rve. pl.16:132.
C. (Cymatosyrinx) hermiona Dall. Galapagos. Proc.56 :70, pl.19:6
C. (Cymatosyrinx) idothea Dall. Magellan Str. Proc.56:8, pl.21:11
C. (Cymatosyrinx) pudica Hinds. Papagayo. Rve. pl.23:199
C. (Cymatosyrinx) rosae Sby. Central Amer. Rve. fig.43
C. (Cymatosyrinx) rugifera Sby. Galapagos. Rve. pl.15:127
C. (Cymatosyrinx) splendidula Sby. Galapagos. Rve. pl.3:60.

C.(Carinodrillia) alcestis Dall. Guaymas. Proc. 56:18,pl.5:6
C. (?) bicanifera Sby. Central Amer. Rve. pl. 12:103
C. (Carinodrillia) callianira Ball. Lower Calif. Proc.56 :16, pl.5:2.
C. (Carinodrillia) duplicata Sby. Central Amer. PZS 1833.
C. (Carinodrillia) haliplexa Dall. La Paz. Proc. 56:19, pl.5:5.
C.(Clathrodrillia) nautica P&L. Acapulco. Proc. Ac. Nat Sci. Phil.84:44,pl2.1
C. (Clathrodrillia) panthea Dall. Panama. Proc. 56:4, pl.1:5
C.(Clathrodrillia) pilsbryi Lowe. Punta Penasco. Trans. San Diego S. 8:23,pl.4
C. (Clathrodrillia) sculpta Hinds. Panama. Rve. pl.18:154.
C. (Crassispira) albonodosa Cpr. Mazatlan. Maz. Cat. #466
C. (Crassispira) adamsiana P & L. Panama. Proc. Ac. Nat. Sci. 84:48,pl.2:11
corrugata Ads. (not Sby.). Panama Shells, p. 140.
C. (Crassispira) amathea Dall. Acapulco. Proc. 56:27, pl.6:2.
C. (Crassispira) appressa Cpr. Cape San Lucas. Proc. 56:22, pl.7:2
C. (Crassispira) arsinoe Dall. Battholme Bay. Proc. 56:26, pl.7:6.
C. (Crassispira) atramentosa E.A.S. Panama. Ann. Mag. N.H. v.10,1882,p.211.
discors Sby. Ecuador. Rve. pl.6, f.38.
C.(Crassispira) aterrima Sby. Monte Christi. Rve.pl.12:100
is discors Sby. vide Tomlin.
atrior C.B.A. vide Cpr. Panama. Panama Shells, no. 164.
melchersi Menke. Type loc. Mazatlan.
C. (Crassispira) aureonodosa P & L. Acapulco. Pr. Ac. Nat. Sci. 84:50,pl.3:2
C. (Crassispira) bacchia Dall. La Paz. Proc. 56:25, pl.6:1.
C. (Crassispira) bicolor Sby. Galapagos. Rve.
C.(Crassispira) fonseca P & L. La Union, San Salv. Pr. Ac. Nat. Sci.84:50
C. (Crassispira) grandimaculata C.B.A. Panama. Pan. Shells #174
dirce Dall vide Lowe Panama- Proc. 56:, pl.6:3.
C. (Crassispira) granulosa Sby. Panama. Rve. pl.11, fig.90
C. (Crassispira) hanleyi Cpr. Mazatlan. Maz. Cat. #468.
C. (Crassispira) hartfordiana Reeve.
C. (Crassispira) hermanita P & H. Acapulco. Pr. Ac. Na . Sci. 84:53,pl.3:6
C. (Crassispira) incrassata Sby. Panama. Rve. pl.9:76
- bottae Val. vide Reeve, not Defrance.
C. (Crassispira) lokospira P. & L. San Juan del Sur. Pr. Ac. Nat Sci. 84:52
C. (Crassispira) luctuosa Hinds. Magdalena Bay. Rve. pl.18:149
palliata Reeve/ Reeve sp. 193.
C. (Crassispira) martinensis Ball. Cape San Martin. Proc. 56:27, Pl.13:4
C. (Crassispira) micans Hinds. Papaguayo. Voy. Sulphur, p.23,pl.7:11
is Clacocyme vide Lowe.
C. (Crassispira) melchersi Menke see aterrima.
C. (Crassispira) monilifera Cpr. Mazatlan. Maz. Cat. #464
C. (Crassispira) montereyensis Stearns. Monterey. Grnt. Gale. p.581,pl.26:9
pudica Arnold, not Hinds. Pal. San Pedro. p. 208, pl.8;13.
C. (Crassispira) nephale Dall. Panama. Proc. 56:23, pl.7:1
C. (Crassispira) nymphia P. & L. La Paz. Ac. Nat. Sci. Phil. 84:51
C. (Crassispira) pluto P. & L. Guaymas. Pr. Ac. Nat. Sci. 84:49, pl.2:12
C. (Crassispira) rudis Sby. Monte Christi. Rve. pl.7:53
C. (Crassispira) rugitecta Dall. Bartholome Bay. Proc.56:26,Pl.7:6
C. (Crassispira) rustica Sby. Xipixipi. Rve. pl.11:91
C.(Crassispira) tepocana Dall. Cape Tepoca. Proc. 56:25, pl.6:5
C. (Crassispira) tiarella Kiener. Type loc. ?
C. (Crassispira) tomliniana Melville. Panama. Pr. Mal. Soc. 17:154,pl.12:2
C. (Crassispira) trimariana P & L. Maria Madre Id. Pr. Ac Nat Sci. 84:52
C. (Crassispira) sowerbyi Reeve. Montija. Rve. pl.6:49

corrugata Sby.
. (Crassispira) solitaria P & L. Mazatlan. Pr. Ac. Nat Sci. 84:53,pl.[illegible]:5
C. (Crassispira) unicolor Sby. Panama. Rve. pl.11:92.
C. (Crassispira) zonulata Reeve. Monte Christi. Rve. pl.6:39.
concta Sby., not Lamarck.
C. (Brachytoma) adbera Dall. Panama. Proc.56:12,pl.4:5
C. (Brachytoma) albovallosa Cpr. Mazatlan. Maz. Cat. #465.
C. (Brachytoma) cornuta Sby. Caracas
C. (Brachytoma) erigone Dall. Panama. Proc. 56:21, pl.7:8.
? C.(Brachytoma) militaris Hinds. Veragua see Rve. pl.7:65
C. (Brachytoma) nigerrima Sby. Panama. Rve. 12:102.
C. (Brachytoma) stromboides Sby. Panama. Rve. pl.9:71.
C. (Drillia) hexagona Sby. Guacomyo
Genus Bellaspira Conrad,1868.
B. grippi Dall. San Diego. Oldroyd v. 1, p.72, pl.11:15.
B. melea Dall. Panama. Proc. 56:29,pl.19:8
Genus Mangelia
M. amathula Dall. San Diego. Proc. 56:78,pl.21:2
M. electra Dall. Conception Bay, L.C. Proc. 56:77
M. fusconodata Cpr. Cape San Lucas. Oldoryd vol.1,p.148
M/ hebe Dall. San Diego. Proc. 56:63, pl.20:10
M. hexagona Gabb. Fossil. Rec. Monterey to San Diego.
branneri Arnold. Fossil
cuentinensis Fossil
M. janira Dall. San Diego. Proc. 56:76, pl.21:10.
M. merita Hinds. Nicoya. Voy. Sulphur, p.21, pl.6:20.
M. ordinaria E.A.S. Chileand Peru. Ann. Mag. N.H. v.10,1882.p.216. Tryon 6-250
M. painei Arnold. Fossil. Proc. 56:65, pl.23:3
M. (Bela) amycla Dall. Panama. Proc. 56:61,pl.20:8
M. (Bela) antiochroa P & L. Panama. Ac. N.S. p.56,pl.3:8
M. (Bela) antipoda Dall/ Magellan Str. Proc. 56:41, pl.19:1.
M. (Bela) antipyrgus P & L. Acapuloo. Ac. N.S. p. 57, pl.3:12
M. (Bela) arteaga Dalland Bartsch. Barkley Snd. Canada Sur. 14 N, p.11,pl.2:4
var roperi Dall Monterey. Proc. 56:64, pl.22:5
M. (Bela) bella Hinds. Veragua. Rve. pl.18:146
M. (Bela) beta Dall. Pt. Ano Nuevo Proc.56:64, pl.22:4
M (Bela) carpenteri de Folin. Panama
M. (Bela) cesta Dall/ San Pedro. Pr. 56:71, pl.21:7
M. (Bela) constricta Gabb. Catalina. Oldroyd v.1,pt.1,p.134
M. (Bela) cymatias P & L. Acapulco. Ac. N.S. p. 56, pl.3:10
M. (Bela) cyrene Dall. La Paz. Proc. 56:62, pl.21:5
M. (Bela) danae Dall. Gulf Calif. Proc. 56:63, pl.21: 6
M. (Bela) godfroidi de Folin. Panama
M. (Bela) hecetae D&B Barkley Snd. Canada Sur. p.10, pl.1:6
angulata Cpr (not reeve) Catalina. Pal. San Pdro. p.212,pl.7:9
barbarensis Oldroyd. new name for angulata.
M/ (Bela) hooveri Arnold. Fossil. Rec. San Pedro to San Diego. Pal. S.P. p 212
M. (Bela) interlirata Stearns. Monterey. Pal. San Pedro p.213, pl.6:15
var pedroana Arnold. Fossil. Pal. San Pedro p.213,pl.6:3
M. (Bela) occata Hinds. Veragua. Voy. Sulphur p.19,pl.19:10
M. (Bela) oenoa Dall. San Pedro. Proc.56:66, pl.8:6
M. (Bela) variegata Cpr. Sta Barbara. Tryon vol.6,p.300,pl 22:57
M. (Mitromorpha) filosa Cpr. Sta. Barbara Proc. 15:200,pl.19:1
M. (Mitromorpha) gracilior Hemphill. Monterey. Grant & Gale p.597,pl.25:22
var intermedia Arnold. Pal. San Pedro p 223, pl.4:10.

M. (Mitromorpha) interfossa Cpr. Neah Bay. Oldroyd v.1,pt.1,p.144.
var barbarensis Arnold Smith Misc. Coll. v.50, p.20,f.1.
M. (Mitromorpha) limans Dall. Gulf Calif. Proc. 56:14, pl.13:3
M. (Mitromorpha) rhyssa Dall. Gulf Calif. Proc. 56:62,pl.21:3
M. (Zetekia) gemmulosa C.B. Adams Panama. Panama Shells #173
denticulata Dall(vide Lowe) Panama. Proc. 56:73, pl.1:1.
M. (Agathotoma) aculea Dall. San Diego. Pr. 56:74
M. (Agathotoma) aegialea Dall. Magdalena Bay, 56:58, pl.18:8.
M. (Agathotoma) aethra Dall. La Paz, Proc. 56:5x, pl.18,f.6
M. (Agathotoma) camarina Dall. Galapagos. Proc. 56:80,pl.24:9
M. (Agathotoma) carissima P & L. Manzanillo. Pr. Ac. N.S. 84:58,pl.4:1
M. (Agathotoma) doris Dall. Agua Verde Bay. Pr. 56:55, pl.18:4
M. (Agathotoma) euruclea Dall. Agua Verde Bay. Proc. 56:79, pl.24 :5-11
M. (Agathotoma) finitima P & L. San Juandel Sur. Pr. Ac. N.S. 84:60,pl.4:5
M. (Agathotoma) hastula P & L. San Juan del Sur. Pr. Ac. N.S. 84:59,pl.4:4
M. (Agathotoma) helona Dall. Agua Verde Bay. Proc. 56:55,pl.18:2
M. (Agathotoma) hippolita Dall. San Hippolito Pt. Proc. 56:76,pl 21:6-8
M. (Agathotoma) hilaira Dall. Gulf Cdif. Proc. 56:61, pl.23:6
M. (Agathotoma) louisa Dall, San Luis Obispo. Proc.56:75, pl.24:3
M (Agathotoma) melita Dall. Agua Vefee Bay. Proc. 56:30, pl.24:7
M. (Agathotoma) niobe Dall. Panama. Proc. 56:77, pl.23:4-5
M. (Agathotoma) nereis P & L. San Juandel Sur. Pr. Ac. N.S. 84:59,pl.4:2
M.(Agathotoma) penelope Dall. Agua Verde. Proc. 56:80,pl.24:10
M. (Agathotoma) phaethusa Dall. Conception Bay. Proc.56:78, pl.24:1
M. (Agathotoma) phryne Dall. Panama. Proc. 56:80,pl.24;12.
neglecta C.B. Adms. (vide Lowe). Panama. Panama Shells
despecta H. & A. Adms., and Tryon
M.(Agathotoma)pyrrhula Dall. Cape San Lucas. Proc. 56:79, pl.24:6
M. (Agathotoma) quadriseriata Dall. Gulf Cdif. Pr. 56:75,pl.24:8.
M. (Agathotoma) scammoni Dall. Scammon's Lagoon. Proc. 56:57, pl.18:1
M. (Agathotoma) subdiaphana Cpr. Cape San Lucas. Proc. 56:75,pl.24:4
M. (Agathotoma) taeniorata P.& L. San Juan del Sur. Pr. Ac. N.S. 84:60,pl.4
M. (Agathotoma) telamon Dall. Gulf Cdif. Proc. 56:58, pl.18:5

Genus Clathurella

C. affinis Dall. Cape San Lucas. Proc. Cal. Ac. Sci. v.5, pl.2:7
C. adana Dall. Conception Bay. Proc. 56 :52, pl.17:1
C. adria Dall. Sta Maria Bay. Proc. 56:52, pl.17:5
C. aspera Hinds. Guayaquil. Reeve pl.25:224.
C. aurea Cpr. Mazatlan. Maz. Cat. #472
bicanilifera Sby. Central Amer. Rve. 13,fig.103.
plus ariculosa Sby. vide Tomlin
C. candida Hinds. Veragua. Voy. Sulphur p.20, pl.6,f.18
C. canfieldi Dall. Monterey. Tryon 5:280; Amer. Jr. Conch. 7:101,pl.15:9
C. conradiana Gabb. Fossil. Grant & Gale p. 606, pl. 26:11.
cymodoce Dall. Sta. Barbara. Proc. 56:54, pl.17:6
C. ericea Hinds. Veragua.
C. fuscoligata Cpr. Panama. Proc. Zool. Soc. 1856, p.163.
C. laodice Dall. Manta Proc. 56:70, pl.21:3. Strong questions genus.
C. crystallina Gabb. Catalina. Bull. 112, pl.6:4.
lowei Dall. Catalina. Proc. Biol. Soc. Wash. 16:172
C. acuticostata Cpr. Panama. PZS 1856, p. 162.
C. hamata Cpr. Panama. Ann. Mag. N.H. 15:399. Dall questions locality.
C. immaculata Dall. Panama. Bull. Mus. Comp. Zool. 43:289, pl.1, f.9
C. impressa Hinds. Papagayo. Voy. Sulphur p.21,pl.6:23-24

C. intercalaris Cpr. Panama. Proc. Zool. Soc. 1856, p. 163
C. neglecta Hinds. Nicoya. Reeve pl.25:218
C. pardalis Hinds. Nicoya. Reeve, pl.23:196
C. partefilosa Dall. Cape Tepoca. Proc. 56:53, pl.17:4.
C. philodica Dall.Monterey. Proc. 56:66, pl.22:7. Strong questions genus.
C. quisqualis Hinds - Elogozyma. Papagayo. Voy. Sulphur p.19, pl.6:5
C. rava Hinds. Nicoya. Proc. Ac. Nat. Sci. 84:55, text fig.
C. rigida Hinds. Panama. Reeve, pl.25:216
C. serrata Cpr. Panama. PZS 1856, p. 163.
C. sirena Dall. Galapagos. Proc. 56:53, pl.17:3.
C. stromboides Sby. Panama, Reeve.
C. subangulata Cpr. Mazatlan. Maz. Cat. #473.
C. Thalassoma Dall. Cape Lobos. Proc. 56:52, pl.17:2.
C. trichoides Dall. new name. Proc. 56:62, pl.19:3.
    hirsutum de Folin (not Bellardi). Panama. Tryon v.6:270, pl.30:75.
C. stonei Hertlein & Strong. Galapagos Pleist. Proc. Calif. Ac Sci.23:375,pl.
C. (Nannodiella) fraternalis Dall. Cape San Lucas. Proc. 56:60, pl.20:5
C. (Nannodiella) nana Dall. Cacachitas. Proc. 56:~~180~~,59Pl.20,f.7
    Genus Moniliopsis
M. briseis Dall. Drakes Bay. Proc. 56:35,pl.22:1.
M. diaulax Dall. Coronado Isl. Proc. 34:247
M. fancherae Dall. Catalina. Proc. 56:28, pl.8:3
    halcyonis Dall San Diego. Proc. 56:29, pl.8:1.
M. grippi Dall. San Diego. Proc. 56:27, pl.8:2.
M. incisa Cpr. Puget Snd. Proc. 56:28, pl.12:7
    cancellata Cpr. , not Sowerby. Puget Sound.
    rhines Dall New name for cancellata. Proc. 56:28, pl.8:5.
    ophioderma Dall. Proc. 56:28, pl.12:5.
    inermis Hinds (not Bartsch). Magdalena Bay.
    penicillata of authors.
M. quentinensis Dall. San Quentin Bay. Proc. 56:32, pl.9:9.
    Genus Hemipleurotoma
H. benthima Dall. Panama 1270 f. Bull. MCZ 43:267,pl.1:7
H. eldorana Dall. Panama. 1270 f. Bull. MCZ 43:268, pl.14:8.
H. monochorda Dall. Panama 1070 f. Bull. MCZ 43:292, pl.13:1.
H. movilla Dall. Acapulco. 660 f. Bull. MCZ 43:285, pl.14:6.
H. peruviana Dall. Peru 1036f Bull. MCZ 43:392, pl.13:2.
H. serilla Dall. Panama 1270 f. Bull. MCZ 43:269, pl.13:6
H. vicella Dall Panama 1270 f. Bull MCZ 43:268, pl.14:5
    Genus Taranis
Taranis strongi Arnold. Fossil. Grant & Gale p.572, pl.26:37
    Genus Teres
T. panope Dall. Ecuador 401 f. Proc. 56:81, pl.9:2
T. zeuxippe Dall. Galapagos 40f. Proc. 56:81, pl.3:3.
    Genus Burchia
Burchia redondoensis Burch. Redondo Beach. Nautilus 52:21,22,1938.
Burchia clionella Dall. Gulf of Panama.

The following comments are made by Mr. A.M. Strong in his notebook and many of themare of interest to us.

" Dall uses the genus Turricula and places under it as subgenera Knefastia and Surcula. Woodring makes Knefastia a good genus and at least for some of the shells placed by Dall in Surcula suggests the new genus Fusiturricula. He

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also states that both Turricula and Surcula are oriental groups and need not be considered in the West Indies.

Grant and Gale use the genus Clavatula and under it Knefastia as a subgenus for the west coast shells. They also include Carinodrillia as a section stating that the type is like Turricula tho the other species placed in the genus by Dall are distinct. The specimen figured by Dall shows a partly formed lip, but in the description Dall states that the anal sulcus is deep and rounded which does not agree with the figure. Evidently their conclusions are based on the figure only and the section does not belong here. They also use the genus Turricula with Pleurofusia as a subgenus for shells similar to those placed by Woodring in the genus Fusiturricula. The question of the character of the nuclear whorls as stated by Woodring and Grant and Gale is one that we hardly need consider. My idea is to consider Knefastia and Fusiturricula as good genera, with a number of species.

Knefastia Dall, type Pleurotoma olivacea Sowerby, not Reeve. We have specimens of three very similar forms which evidently represent olivacea Sowerby, funiculata Val. and tuberculifera Brod. & Sby. The various figures and quoted synonymy make it difficult to say which really belongs to which name. Dall and others list Pleurotoma duplicata Sowerby as belonging here. Reeve's figure is imperfect and does not show the notch or canal. Also there is no sign of the two spiral cords for which the name is given which is mentioned in both Sowerby's and Reeve's description. Tryon copies several othr figures of the species, none of which look anything like Reeve's figure. Pilsbry and Lowe identify an entirely different shell, very close to Carinodrillia alcestis Dall as duplicata Sowerby. I do not think that duplicata belongs here. Knefastia nigricans Dall certainly belongs here. Turricula maura Sowerby as I have identified it is very similar if not identical. To these I would add Turricula maculosa Sowerby. These shells are slender with a moderately long canal, the notch rather shallow, rounded,unarmed,close to the suture. The sculpture consists of short axial ribs or axially elongated nodes and a number of fine spiral threads. Turricula libya may belong here tho the canal is somewhat shorter and the spiral sculpture is absent. Turricula (Surcula) laysanica Dall is a northern shell and probably does not belong here at all. Turricula (Surcula) panthea Dall has a different notch and different sculpture and can hardly be placed here. I have a note that Drillia punctatostriata Carpenter may belong here. This is described in P.Z.S. for 1856,p.164. It has never been figured and I do not have the description. 1. This gives us the following: Knefastia dalli Bartsch, funiculata Val., maculosa Sowerby,maura Sowerby,nigricans Dall,olivacea Sowerby,tuberculifera Broderip and Sowerby, ? libya Dall,?and punctatostriata Carpenter.

Genus Fusiturricula Woodring. Type, Turris (Surcula)fusinella Dall. The three species described by Dall; fusinella,armilda, and dolenta are closely related and perhaps intergrade. Only one was figured and I am not sure of the identification. The shell we have identified as arcuata Reeve seems to belong here. There is some doubt if we can use this name for a west coast shell, see Tomlin, Proc. Mal. Soc. vol.21, p.38. Lavinia Dall seems to be a very similar shell but larger and with shorter canal. Woodring gives a good description of the genus. We would have the following species: 2. Fusiturricula ? arcuata Reeve,armilda Dall,dolenta Dall,fusinella Dall,lavinia Dall.

Woodring describes a new genus Polystira and says that it is the American tropical representative of the Indo-Pacific Turris. He states that the west coast picta Reeve and albicarinata Sowerby belong to a subgenus under Polystira. He suggests no name for this subgenus. Grant and Gale use the name Turris for west coast shells and place picta and oxytropis Sowerby in Turris s.s.

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Bartsch in Smithsonian Misc. Coll. vol.91, no.2, p.8 shows that the type for Polystira as given by Woodring cannot be used and designates another species as the type. This does not seem to affect the generic characters as he describes and figures a new species from the West Indies very similar to oxytropis under Polystira. Woodring gives a good description of Polystira , but the type according to Bartsch should be Murex virgo Wood , not Pleurotoma albida Perry as stated by Woodring. There seems to be but four specific names applied to west coast shells which are very similar and considered identical by Tryon and others. albicarinata Sowerby,1870 seems to be identical with oxytropis Sowerby,1833. Turris rombergii Morch is also a synonym. I recognize three species as follows: Polystira nobilis Hinds, oxytropis Sowerby,and picta Beck in Reeve.

Carpenter lists Pleurotoma gemmata Hinds from Magdalena Bay but this locality is very doubtful. Grant and Gale give it under Gemmula which they make a subgenus of Turris. The various species described by Dall as Gemmula seem to belong elsewhere. The deep water and cold water shells listed by Dall under Gemmula, Leucosyrinx and Irenosyrinx and by Grant and Gale under Leucosyrinx and various subgenera are not represented in our collections.

The genus Ancistrosyrinx seems to be recognized generally. Woodring and Grant and Gale both describe it. We have but one species on the coast, usually listed as Ancistrosyrinx cedo-nulli Reeve. There is some question as to the type locality for this name. Tryon gives it as Japan. It is not unlikely that our shell needs a new name. The genus is very distinct and species from various localities are quite similar.

The genus Lora as used by Grant and Gale and at least in part by Dall seems to be restricted to a northern group. Grant and Gale's statement as to type is not correct as has been shown by Pilsbry and as a result their conclusions will have to be revised.

The genera Borsonia and Spirotropis with various subgenera as used by Grant and Gale seem to be a general mixture and should be separated into several genera. The group with a plication on the columella for which Dall uses the name Borsonella should stand, if for convenience in classification only, Also the left and right handed species they place in a subgenus Antiplanes should be separated in some way.

There seems to be some question about the use of the genus Pleurotomoides Born. Dall uses the name Pleurotomella Verrill , and describes a number of west coast species, all from 400 to 1000 fathoms or more.

Grant and Gale use the genus Hemipleurotoma Cossman, type from the Eocene of Italy. They make the genus Cryptogemma Dall a synonym, stating that except for the type the various species described by Dall under that name belong in Spirotropis etc. This is probably another case of basing definite conclusions on a figure only. All are deep water shells.

Genus Pseudomelatoma Dall. Type Drillia penicillata Carpenter. There has been much confusion in regard to the names in this genus,due to failure to recognize the small differences. P. torosa Carpenter is the northern, knobby form found at Monterey and that general district. I doubt if it comes south of Point Conception. P. moesta Carpenter is a much smoother shell found in southern California and at least as far south as Todos Santos Bay. P. aurantia Carpenter is a very smooth color form of this found in southern California. The Mazatlan record probably is a misidentification. Grant and Gale list a subgenus Laevitectum Dall. The only mention I can find of this is the one given by them where Dall lists a ? Clathrodrillia (Laevitectum) eburnea Carpenter. This would hardly seem to be enough to establish a subgenus.

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The shell figured by Dall as eburnea looks very much like specimens of aurantia and is said to be pinkish white. P, penicillata is a larger shell with different sculpture from the others. The Gulf of Calif. record is very doubtful. Drillia digna E.A. Smith is placed in this group by Tryon. It is unfigured and I have not seen the description.

The shells of this group form a small group ranging from Puget Sound to the outer coast of Lower California. Dall places them tentatively in Moniliopsis which he places as a subgenus of the much later described genus Clathrodrillia. Grant and Gale also use the name but place it as a distinct genus. It is very doubtful if the name should be used for our shells, but I find no suggestion of a name that might take its place. We have the following, all of which range south of San Diego or are reported from San Diego only. M. briseis Dall. Dall described this as Antiplanes but it seems to fit here better. M. diaulax Dall. Unfigured and described as Antiplanes. Grant and Gale place it here. M. grippi Dall. M. fancherae Dall. Described as Mangelia but later listed by Dallas Moniliopsis. According to Willett the type is a rather poor, half grown specimen of the later described M. halcyonia Dall. M. incisa Carpenter. Described as Drillia Not of Reeve. M. ophioderma Dall. Surcula ophioderma Dall, new name for Pleurotoma inermis Hinds1843, not of Partsch,1842. Usually considered a shore variety of the deeper water incisa. M. quentinensis Dall. Described as Cryptogemma but placed here by Grant and Gale. The figure indicates that it probably was correctly placed by Dall. M. rhines Dall. Surcula rhines Dall, new name for Pleurotoma cancellata Carpenter,1865, not J. Sowerby,1827.

Genus Daphnella Hinds. Grant and Gale state that the position of the genus in the family Turridae is uncertain. Woodring uses family Daphnellimae Bartsch described a new genus Eudaphne, Proc. U.S.N.M. vol. 79, art.15, p.3. Type Eudaphne allemani Bartsch. This genus name was afterwards changed to Eudaphnella, Nautilus, vol. 47, p.76. Grant and Gale state that Daphnella clathrata Gabb is very similar to D. lymnaeiformis Kiner, the type of Daphnella. Bartsch states that D. clathrata Gabb belongs in his new genus Eudaphnella. Pilsbryand Lowe, p. 61, discuss this but do not state definite conclusions. They however retain Daphnella for the two species they describe. In this group we have listed the following: Daphnella allemani Bartsch, D. bartschi Dall,D. clathrata Gabb, D. mazatlanica Pils. & Lowe, D.panamica Pilsbryand Lowe.

Genus Mitromorpha Adams in Carpenter. Type, M. filosa Carp. Only two species definitely placed in this genus are reported from the Lower California coast. M. filosa Carpenter and M. gracilior Hemphill. Grant and Gale place Mangelia (Clathromangelia) rhyssa here. It is very unlikely that Clathromangilia Monterosato is represented on the coast. It looks like one of the species which stands all by itself tho a good series of live specimens might show differences not shown in Dall's figure. Clathrodrillia limans Dall, also mentioned by Grant and Gale, probably is not a Turrid. It has been suggested that Daphnella casta Hinds can be placed here but the canal is quite distinct and quite different from Daphnella. It seems to be another species that stands all by itself.

Kurtziella Dall. Type Pleurotoma carina Kurtz and Stimpson. The shells placed here by Dallare rather slender, with strong axial ribs and fine spiral sculpture, the whorls angulated, the aperture rather narrow,canal rather long, sinus shallow, indistinct. The following are listed by Dall. K. antipyrgus Pils. & Lowe,K. beta Dall,K. cyrene Dall,K. danae Dall, K. arteaga roperi Dall,K. cymatias Pils. & Lowe,K. antichroa Pils. & Lowe.

Genus Bela Leach in Gray. Type, Murex nebula Montagu. It is very doubtful if this name can be used for any west coast shells. Grant and Gale list a large series under it and if it is confined to rather slender shells with low,nounded axial ribs, the aperture narrow, the sinus indistinct, lip and columella smooth there will be formed a fairly distinct group as follows: Bela cesta (Mangelis), Bela cetolaca Dall (Mangelia- equals Aesopus oldroydae Arnold), B. densilineata Dall (Cytharella),B. hooveri Arnold (Mangelia), B. interlirata Stearns (Mangelia), B. cenoa Dall (Mangelia), B. perattenuata Dall (Mangelia),B. pulchrior Dall or variegata Carp. (Mangelia), B. plumbea Hinds (Daphnella).

Grant and Gale list a section Ishnula Clark in Gray . They place a few species in it and state that theyare more angulated andrelatively shorrter and broader than Bela ss. The species are as follows: B.hecetae Dalland Bartsch (Mangelia), B. barbarensis Oldroyd(Mangelia angulata Cpr Not Reeve., ? Lora antipoda Dall.

Grant and Gale list a few species which they consider to belong to Mangelia s.s. as follows: M. amatula Dall, M. hexagona Gabb, M. quentinensis Dall (Cytharella), M. janira Dall (Cytharella),M. merita Hinds (Clavatula), M. painei Arnold.

Grant and Gale use Agathotoma as a subgenus os Mangelia while Dall uses it as a subgenus of Cytharella, an indeterminate name. The species placed by Grant and Gale in Agathotoma can be divided into at least two distinct groups. There seems to be no description of Agathotoma as a restricted genus or group. As used by Dall it can be described as follows: Shell small,rather slender,sculpture with a few strong axial ribs and fine spiral threads,the aperture narrow,the outer lip varicose,the anal sukcus distinct,rounded,the varix extending around the sulcus to a junction with the body whorl, canal short or slightly differentiated.- A. camarina Dall,carissima Pils. & Lwe.,euryclea Dall,finitima P&L,hastula P&L, nereis P&L,penelope Dall,phryhe Dall,pyrrhula Dall,striosa C.B. Adms,taeniornata P&L,? Haedropleura melita Dall.

Cytharella as used by Dall is very similar to Agathotoma but is usually stouter, with more numerous axial ribs and stronger spiralsculpture. The anal sulcus is at the suture and the varicose lip does not extend to the junctionwith the body whorl. Pilsbryand Lowe use Cytharella for the shells Dall calls Agathotoma. Woodring described a new genus Ithycythara, type Mangelia pusilla Bush and designates a type for Cytharella, Murex costatus Donovan, Recent of Europe, while Dall uses a different type. The nuclear whorls, w here described by Dall, are more like those of Woodring's new species than of Cytharella as defined by his new type. It looks like Ithycythara Woodring could well be used for one or both of these groups.

Philbertia as described by Dall is stated to have the outer lip dentate but with the exception of two or three species allthe species described by Dall from the west coast are without denticles on he outer lip; Woodring does not recognize Philbertia in the Bowden fauna but mentions that the type is a European shell. Grant and Gale make Philbertia Dall, 'in part, a synonym of Mangelia, subgenus Agathotoma. I see no reason for not combining the species described by Dallas Cytharella and Philbertia in a single genus. The list would be as follows: aculea Dall (Cytharella), aethra Dall (Philbertia), cymatias Pils. & Lowe (" Mangelia"), dictynna Dall (Philbertia), dorisDall(Philbertia),electra Dall (Cytharella),? formicaria Sowerby (Pleuotoma),fusconotata Carp.(Cithara),helena Dall (Philbertia),?hilaria Dall (Philbertia),hippolita Dall(Cytharella),louisa Dall(Cytharella),?neglecta C.B. Adms. (Pleurotoma),niobe Dall (Cytharella),phaethusa Dall (Cytharella), cuadriseriata Dall (Cytharella),scammoni Dall (Philbertia),subdiaphana Carpenter (Mangelia).

Genus Adelocythara Woodring is described with only one species in the Bowden fauna, the apertural armature more reduced than in Dthycythara, the outer lip with a single denticle immediately below the notch. The figure of Philbertia aegialea Dall seems to show a similar denticle (not mentioned in the description) and is otherwise a very similar shell.

" Mangelia" melanosticita Pilsbryand Lowe, is the type of Stieronepion Pilsbry & Lowe. The statement is made that " This species is closely akin to " Mangelia (Clathromangàlia)lineolata Reeve." of west coast conchologists. This later has been renamed by Pilsbry as fredbakeri and placed with Anachis. Grant and Gale place it in Chauvetia.

Dall describes a genus Zetekia, type Z. denticulata Dall. Lowe consid- this species to be identical with Pleurotoma gemmulosa C.B. Adams. This to be a good genus with but two species known from the coast. The shell is similar in size and shape to Mitromorpha but there is a distinct,rounded sinus. The second species is Zetekia curta and is unfigured.

Genus Cymatosyrinx Dall , type Pleurotoma lunata Lea , as figured by Grant and Gale has distinct axial ribs but is without spiral sculpture. Most but not all of the species described by Dall in the genus are smooth between the axial ribs and the genus can well be confined to such species.

Genus Elaeocyma Dall. Type, Drillia empyrosia Dall. Dall does not seem to have described this other than to designate the type. There is a small group similar to he type. Theyare large shells, over 30 mm. in length with the axial ribs and aperture similar to Cymatosyrinx but with fine, more or less indistinct spiral sculpture present. The main distinguishing character is that the back of the lastwhorl is smooth, more or less humped and frequently of a darker color than the rest of the shell.

Clathurella Carpenter. Type Clavatula rava Hinds. While there has been considerable question as tothe validity of this name it seems to have been accepted by Woodring, Grant and Gale,and Pilsbryand Lowe. Grant and Gale's description of the genus and the synonymy of the species is not correct. Pilsbryand Lowe state that he type has not been figured on a sufficiently large scale to show all the characters and give a good figure of a typical shell. They also state that the group seems generically separable from Glyphostoma by the short , sidesiphonal sinus and the small number of transverse ridges on the columella,also the less impressed anal fasciole without the numerous subsutural folds. Their revised description of the type states that the lip is preceded by a strong varix and has a series of teethwithin. The canal is very short and there is no trace of a stromboid notch.

Glyphostoma Gabb. Type, Glyphostoma dentiferum Gabb. Grant and Gale consider this to be a synonym of Clathurella but both Woodring and Pilsbry and Lowe consider it to be a good genus. ...

There seems to be a great deal of difference of opinion as to what weight can be placed on he presence or absence of teeth on the inner or outer lip or both. Grant and Gale give almost no weight to it. Pilsbry and Lowe in Lioglyphostoma do not seem to consider low denticles on the type as important as the species they list here do not seem to have them, Bartsch in placing Glyphostomops without a denticle as a subgenus of Glyphostoma with denticles also does not seem to consider the presence of the denticles to be a generic character. It would help greatly if the character of the denticles could be considered as definite generic or subgeneric characters."

NEWS and NOTES

Walter J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. " In a few days I will be off for Alaska again to the herring fishery in Prince Wm. Sound and Raspberry Strait. In spare time I hope to add a few more species of shells to the over 100 that I got last year. When I get around to it I will send you a series of the summer's collection.

I read with interest about Dr. Schenck inspecting the marine biological laboratory of the Emperor of Japan. It reminds me that when Professor Trevor Kincaid of the Univ. of Wash. was visiting Japan some years ago Emperor Hirohito specially requested him to make use of his famous laboratory. I am at least glad that I managed to get two superb specimens of Pleurotomaria hirasei and a lot of other very rare shells from Japan before the war.

If Mr. Chace will look again at the notes on Acmaea ochracea he will find that it was not that species but A. peramabilis that I collected in Drier Bay, Pr. Wm. Snd., but it looks more like a Lepeta. The U.S. National Museum identified my specimens and I still believe they are right."

William K. Emerson, 2435 Bancroft St., San Diego 2, Calif. " Last November we tried a little dredging off Mission Beach, Calif. As far as mollusks are concerned we were not successful, but we did find two live specimens of Pyrosoma giganteum Lesueur, lumiscent Ascidians. I understand that these tunicates are not too common. They are most interesting colonial creatures.

As for other collecting, last December I found a great number of the minute, Fartulum orcutti Dall, at El Morro Pt., Baja Calif., Mex. These were found in masses on rocks near the high tide mark. One rock must have had over 100 specimens on it.

I do not know what the record is for keeping Cypraea alive in aquaria but we kept one from Mission Bay going some 120 days. It was still going strong when I removed it from the aquarium. After the first week, its mantle was partly withdrawn, and apparently it utilized stored food as well as algae. We had wonderful success with nearly everything we attempted to keep. Especially is this true of pond fishes.

I hope to do considerable exchanging this summer and intend to get started within the next two weeks."

Dr. Wesley R. Coe, Scripps Institution of Oceanography, La Jolla, Calif. " Your enterprising and wide awake Minutes are always awaited with interest and always interesting. May they long continue."

E.B. Sprague, 417 First National Bank Bldg., Santa Ana, Calif. " " After this year I hope to be able to attend some of the meetings."

F.R. Aldrich, Aldrich Museum, Bay Island Club, Balboa, Calif. " A late experience, during my twenty six years of this work I have collected about fifty of the Diplodonta orbella, then lately in a very short time I collected 1800 with about 500 in the nest. Sometimes we get a thrill."

Mr. A.S. Koto and Adele Koto, 1421 Roosevelt Ave., Beloit, Wisconsin. Please note change in address of the Kotos. 1 & 7

Captain C.M. Dumbauld, U.S. Naval Hospital, Chelsea 50, Massachusetts. The above is the latest correct address.

Allyn Smith, 722 Santa Barbara Road, Berkeley 7, Calif. " In the Minutes No. 48, p.17, May, 1945, there is a statement that the types of Onchidella borealis Dall were in the California Academy of Sciences, sealed in alcohol. In checking this statement in the process of trying to identify a large series of Onchidella that Dr. Hanna and I collected at Little River earlier this month, I was unable to find the specimens mentioned and am forced to the reluctant conclusion that it is not correct. "

Dr. Paul Bartsch, Curator, Divisions of Mollusks and Cenozoic Invertebrates, United States National Museum. " I am pleased to say that at the end of the month I retire from my curatorial responsibilities and become Research Associate of the Smithsonian Institution. This will relieve me of many of the inquiries that come to my desk daily. I shall devote my time then to research and hope that we may progress a little more rapidly than we have in the past, in which research played only an incidental part, for the curatorial work and public service work, as in other departments of our institution, had to take precedence."

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New Publications

Johnsonia vol.2, no. 19 and 20, No. 20 " The Genus Mya in the Western Atlantic" by Richard W. Foster and No. 21 " The Family Haliotidae in the Western Atlantic" No. 19 is " The Genus Bankia in the Western Atlantic" by William J. Clench and Ruth D. Turner.

These papers are beautifully illustrated and continue the excellent and careful work of the previous issues.

Revista De La Sociedad Malacologica " Carlos De La Torre ", vol.4, no.1, May,1946. Our fellow students in Cuba are publishing in their " Revista" a periodical of which we may all be proud. In this issue the first paper is a biographical sketch with a full page photograph of Dr. Thomas Barbour, (1884-1946). " A New Helicina from Hispaniola" by W.J. Clench and M.L. Jaume. Several new species of marine mollusks are described by Carlos G. Aguayo and Primitivo Borro " Nuevos Molluscos Del Terciario Superior De Cuba". and by Miguel L. Jaume and Primitivo Borro " Novedades En Molluscos Marinos Cubanos". " Adiciones Al Estudio De La Familia Fissurellidae" by Isabel Perez Farfante - This paper is of particular interest to us because our species Lucapinella callomarginata Dall is described and discussed at length. It is compared to L. limatula Reeve of the West Atlantic. They are similar other than that the orifice is oval in callomarginata and triangular in limatula according to the author. This paper should supplement the treatise in Johnsonia vol.1, no.10, p.20,1943. " Nuevo Farcimoides De La Republica Diminicana" by Miguel L. Jaume and Oscar Alcalde. All of the above papers are beatifully illustrated. Some of our photographers and printers could well take note.

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The editor of these papers made a collecting trip to Newport Bay on the early morning of June 2 accompanied by Mrs. Burch and Mr. and Mrs. John Whitmore. The haul brought our nothing new but some rather nice samples of some not too common species such as Trachycardium quadragonarium, Lima dehiscens, a number of rather nice Murex trialata. It might be noted that large numbers of exceptionally large and also fine specimens of Murex festivus Hinds were spawning on the eel grass along with countless Vesica gouldiana. Another thing of some interest was that we observed a number of the large Japanese Ostrea laperousii or gigas if you prefer on the rocks around the tide mark. Apparently this exotic oyster has seeded itself to some extent at least in Newport Bay.

Another thing that added to the pleasure of our trip was that we ran into another group of shell collectors. They were Earl Huffman and party. It was also our pleasure to meet Mrs. Huffman.

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The Long Beach Shell Club has published a very attractive program for the year 1946 and a complete list of members with the addresses.

The interests of those on the following lists will be indicated when known by the numbers in the following key.

1. World Wide Sea Shells
2. Pacific Coast Shells
3. Marine Shells
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Johnson, Mrs. Edward M., Box 444, Falmouth, Mass. 1,2,3,7,10.
Johnson, Dr. Myrtle E., 4647 Fifty-fifth St., San Diego 5, Calif.

Keen, Dr. A. Myra, Box 1563, Stanford University, Calif. 1,2,[illegible],11.
Keppen, Leaona, 1963 Waltonia Dr., Montrose, Calif.
Kerckhoff Marine Laboratory, Corona del Mar, Calif.
Koto, Miss Adele , 1421 Roosevelt Ave., Beloit, Wis. 1,3,4,7.
Kozloff, E. , Dept. of Zoology, Univ. of Calif., Berkeley 4, Calif.
Kimball, S.M., P.O. Box 46, Weaverville, Calif. 3 Pacific Islands.
Kincaid, Professor Trevor, Univ. of Wash., Seattle, Wash. 1,2,3,10
Ladd, Dr. Harry S., U.S. Natl. Museum, Washington 25, D.C.
Lee, Charles B., 69 Verplanck St., c/o Dickson, Buffalo 8, N.Y. 1,3,4,5,7,8,9
Leonard, Dr. A. Byron, Dept. of Zoology, Univ. of Kansas, Lawrence, Kansas.
Light, Dr. S.F., Dept. of Zoology, Univ. of Calif., Berkeley 4, Calif.
Linderman, Mrs. Leona, 80 62nd Pl., Long Beach 3, Calif.
Lloyd, Dr. W.L., Cabrillo Museum, San Pedro, Calif.
Long Beach Public Library, Long Beach, Calif.
Los Angeles Public Library, 530 S. Hope St., Los Angeles 13
Lyman, Frank B., Lock Drawer 1412, Lantana, Florida 1,5,6,9,11 and specializes in Florida shells. Dealer in fine specimen shells.
Lundy, Mrs. R., 620 El Camino Ave., Sacramento, Calif.
MacFarland, Dr. F.M., 775 Santa Ynez, Stanford University, Calif. 2,3,10
(Especially Nudibranch Mollusca)
McGinitie, Dr. G.E., 1201 East California, Pasadena 4, Calif.
Magnus, Harry C., 510 43rd St., West Palm Beach, Fla.
Matzen, Mrs. N., Box 768, Escondido, Calif.
Mahaffey, C.R., 276 30th St., San Francisco 14, Calif.
McCulloch, Dr. Irene, Hancock Bldg., University of Southern Calif., Los Angeles
McGinty, Paul P., P.O. Box 345, Boynton, Florida.
Megalhaes, Hulda, Box 283, College Station, Durham, North Carolina.
Melville, Chester W., 20 Hammondswood Rd., Chestnut Hill, Mass. 1,3,4,
Buy rare shells, also buy old books particularly with color plates
Miner, Dr. Roy W., American Museum of Natural History, Central Park West at 79th St., New York, N.Y.
Morrison, Roy L., 3745 Grim Ave., San Diego 4, Calif. 2
Moore, Miss Mary H., 1715 Simkin St., Nashville 8, Tenn.
Museum of Natural History, Urbana, Illinois.
Museum of Comparative Zoology, Harvard College, Cmbridge, Mass.
Natural History Museum, Balboa Park, San Diego 1,Calif. 1,2,3,4,7,8,9,10,11.
Nicol, Davis, Box 2466, Stanford University, Calif. 1,3,11 Pelecypods and Marine Ecology
Nelson, Charles D., Rt. 5, Lake Michigan Dr., Grand Rapids 4, Mich. 1 to 11 inc
Nimitz, Miss Mary, 2914 Forest Ave., Berkeley, Calif.
Nulton, Lucy, East Carolina State Teachers College, Greenville, N.C.
Paleontological Research Institution, 126 Kelvin Pl., Ithaca, N.Y.
Palmer, Mrs. E.L., 206 Oak Hill Rd., Ithaca, N.Y.
Paris, W.G., Boom, Tenn. World Wide Shells- Exch. Fresh Water Shells.
Pomona College, Zoology Dept., Claremont, Calif.
Peavey, Mrs. C.E., 1490 N.W. 39th St., Miami 37, Fla.
Pettitt, Lillian, 175 Mt. Pleasant Ave., Jersey Shore, Pa.
Princeton University, Princeton, N.J.
Putnam, P.G., Anacortes, Wash.
Reed, Paul H. Box 267, Tavares, Fla. Editor of Mollusca.
Rehder, Dr. Harald A., Division of Mollusks, U.S. National Museum, Wash.,D.C. 1,3,4,7,8,11.
Rice Institute, Houston, Texas.
Roscoe, E.J., 2364 S. 9th St., East, Salt Lake City 5, Utah.

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Rutgers University Library, New Brunswick, N.J.
San Jose State College, San Jose, Calif.
Schalie, Henry van der, Museum of Zoology, Ann Arbor, Mich.
Schenck, Dr. Hubert G., Box 1528, Stanford University, Calif.
Schmidt, Jack, 406 North K St., Lake Worth, Fla.
Schweitzer, Dr. Jerome M., 730 Fifth Ave., New York 22, N.Y.
Schwengel, Dr. Jeanne S., 260 Marmaroneck Rd., Scarsdale, N.Y.
Scientific Library, Bureay of Science, Manila, Philippines.
Shafer, F.E., R.R 1, Trenton, Ohio
Shepard, Miss Miriam, Box 164, Route 2, Portland 10, Oregon. 1,2,3,4,8,9.
Sidney E. Marks, 655 Kearney Ave.,Arlington, N.J. 1,3,4,5,6,7,8,9,11
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Smith, Allyn G., 722 Santa Barbara Rd., Berkeley 7, Calif. 2,3,4
Smith, Mrs. Cassat, 41 Walker St., Cambridge, Mass. 3,8,11
Smith, Mrs. Harrington, 803 Weightman Bldg.,1524 Chestnut St.,Philadelphia, Pa. 1,3,5,7,11.
Smith, Dr. Maxwell, Box 65, Winter Park, Florida. 1,5,8.
Sohl, Marshall Jr., 1433 W. 134th St., Gardena, Calif.
Sorensen, A., 247 Granite St., Pacific Grove, Calif.
Spicer, Lt. V.D.P., Rt.2, Box 237, Centralia, Wash. #1 but special interest in Polynesian marine shells.
State Fisheries Laboratory, Terminal Island, Calif.
Stenzel, Prof. H.B., Bureau of Economic Geology, The University of Texas, Austin 12, Texas. 1,3,5,7,8,11. Part Int. in Genotype species Recentand fossil.
Stephens, Mrs. Kate, 3746 Park Blvd., San Diego, Calif.
Stephenson, James M., 207 Quincy, Long Beach 3, Calif.
Strohbeen, John, 315 King St., Santa Cruz, Calif.
Thaanum, D., 43 Coelho Way, Honolulu 8, T. Hawaii.
Tobleman, Fred, 13½ Brenner St., Newark, N.J.
Tretheway, Mrs. Surora, 3796 4th Ave., San Diego 3, Calif.
University of California, 405 Hilgard Ave., Los Angeles 24, Calif.
University of Colorado, Boulder, Colo.
University of Hawaii, P.O. Box 18, Honolulu 10, T. Hawaii
University of Illinois, Urbana, Illinois.
University of Michigan, Ann Arbor, Mich.
University of San Francisco, San Francisco 17, Calif.
University of Southern California, University Park, Los Angeles 7, Calif.
University of Virginia, Charlottesville, Virginia
University of Washington, Seattle 5, Wash.
Van Duzee, Mrs. E.P., P.O. Box 285, Alameda, Calif.
Van Hyning, Dr. T., Florida State Museum, Gainesville, Fla.
Walker, Mrs. H.P., Rt.2, Box 242, Healdsburg, Calif. 1,3,5,7
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Warren, Mrs. Fiske, 8 Mount Vernon Pl., Boston. Mass.
Webb, Glenn R., Ohio, Illinois. 4,7,8,9, and anatomical studies
Webb, Walter F., 202 Westminster Rd., Rochester, N.Y. Dealer.
Webber, Fred S., 271 Maple St., Holyoke, Mass. 3,4,5,6,7/
Weeks, William H., 508 Willoughby Ave., Brooklyn, N.Y.
Wilson, Miss Edna N., 718 Capistrano Pl., Mission Beach, Calif.
Wilcox, Ernest N., 1738 Johnson Ave., San Luis Obispo, Calif.
Woodring, Dr. W.P., Geological Survey, Washington 25, D.C.

Woolsey, Heathcote M., Green Pastures, Kent. Conn.
Wright, L.M., Enterprise, Florida.
Zech, Miss Lillian, 535 W. Highland, Redlands, Calif.
Zetek, Dr. James, Drawer C., Balboa, Canal Zone.

The Following are a few of our foreign correspondents.

The Auckland Institute and Museum, Auckland, New Zealand.
The Australian Museum, Sydney, New South Wales, Australia.
British Museum of Natural History, Cromwell Rd., S.W. 7, London, England.
Carl, Dr. G. Clifford, Provincial Museum, Victoria, B.C., Canada.
Calleja, Walter, 49 Inguanez St., Rabat, Malta
De Mesa, Pedro, Lubang, Mindoro, Philippines
Elliott, Mrs. E.C., 1 Marden Rd., Payneham, South Australia.
Franco, Dr. Asela B., Cebu City, Philippines
Fox, C.E., Siota, Solomon Islands
Freire, Jose A., Heredia 305, Santiago de Cuba, Cuba.
Griffith, W.E., 24 Melita St., Sliema, Malta.
Grech, J.M., 59 Bihind St., Ubaldesca Str., Casal Paula, Malta
Guitart, Dr. Raul P., Kate Plummer Bryan Memorial School, Guines, Cuba.
Hemming, Hon. Francis, 83 Fellows Road (Garden Flat), London, N.W. 3, England
Holloway, Miss M., 32 Pentland Ave., Mt. Eden S2, Auckland, New Zealand
Hadfield, Mrs. W.V., Private Bag, Takaka, New Zealand.
Jackson. Hon. J.W., The Museum, The University, Manchester 13, England.
Jeaking, W.G., 44 Locking St., Nelson, New Zealand.
Jaume, M.L., 13 No. 351, Vedado Habana, Cuba.
Koch, H.J., P.O. Dynamite Factory, Somerset West, South Africa.
Moses, Robert H., 42 Pembury Rd., Totenham, London, N. 17, England.
Mort, Major H.S., 13 Milner St., Mossman, Sydney, N.S.W., Australia.
Mouat, Mary, P.O. Glenfield, Auckland, New Zealand.
Museo Poey, Universidad de la Habana, Habana, Cuba.
Miller, Prof. H.W., Apartado 1320, San Jose, Costa Rica.
National Museum of Canada, Ottawa, Ontario, Canada.
Oughton, Dr. John, Royal Ontario Museum of Zoology, Queen's Park at Bloor St.,
Toronto, Ontario, Canada.
Pattison, George, 68 Partridge St., Gleng, South Australia.
Public Library, Melbourne, Australia
Queensland Museum, Brisbane, Australia.
Salisbury, Hon. A.E., 51 Amersham Hill, High Wycombe, England.
Scientific Library, Bureau of Science, Manila, Philippines
Sociedad Malacologica, " Carlos De La Torre", Apartado 2634, Habana, Cuba.
South Australian Museum, Adelaide, Australia.
Syevenson, A.G., 32 Pentland Ave., Mt. Eden, Auckland S.2, New Zealand.
Tomlin, J.R. le B., 23 Boscobel Road, St. Leonards-on-Sea, England.
Whyte, Mrs. E., 58 Campbell Road, Onehunga S-E 5, Auckland, New Zealand.
Woolacott, Mrs. Leonie, c/o Charlie Messenger, Beach Rd., Edgecliff, Sydney, N.
New South Wales, Australia.
Worthy, Mrs. Ida, R.D. Patumahoe, Auckland, New Zealand.
Winckworth, Hon. R., 71 Whitworth Road, London SE 25, England.

Members of the Long Beach Shell Club not members of C.C. of S.C.

Donaldson, Ethel, 507 S. Downey Ave., Downey, Calif.
Eaton, Miss Ruth E., 326 W. 5th St., Long Beach
Ferris, Mrs. Grace & Mary Jane, 4304 Appian Way, Long Beach
Fowler, C. Ray, 3615 E. 5th, Long Beach

Corham, James Moodes II, 1327 E. 3rd St., Long Beach 4
Higgins, Miss Lena, 2214 Orange, Long Beach 6
Johnson, Mrs. A.M., 3729 Gundry, Long Beach7
Kibler, Vashti, 3510 Lime, Long Beach 7
Lehman, Mr. and Mrs. Claude A., 248 Ximeno Ave., Long Beach 3
Linderman, Mrs. Lena, 80 62nd Pl., Long Beach 3
Libby, Mrs. J.W., 817 Carson St., Long Beach 7
McBride, Mr. and Mrs. J.A., 1443 Lime Ave., Long Beach 6
Mason, Miss Cynthia, 1819 E. 7th St., Long Beach 4
Paxon, Mrs. Alice, 6304 Appian Way, Long Beach 3
Rogers, Miss Julia Ellen, 355 Junipero, Long Beach 4
Rex, Miss Edith R., Avalon, Catalina Island
Pelton, Mrs. Laurence, 4351 Long Beach Blvd., Long Beach 5
Stillwell, Miss Grace, 337 Cedar Ave., Long Beach 2
Totten, Laura Mae, 3819 Brayton, Long Beach 7
Tyselling,Miss Lucille, 853 Atlantic Ave., Long Beach 2
Wentworth, Dr. Hazel, 110 Mira Mar, Long Beach 3
White, Miss Helen E., 334 E. Ocean, Long Beach 2
Quackenbush, Emma J., 1223 E. 3rd, Long Beach
Rolo, Patricia, 915 Terraine, Long Beach
Thompson, Mrs. Ruth, 1415 Silva, North Long Beach

Minutes of the Conchological Club of Southern California- June Meeting

The Conchological Club of Southern California met June 3,1946 at the usual time, but not at the usual place. Due to a change in night watchmen, the Museum building was locked. However, we were assured that precautions will be taken to insure that it will not happen again. We were cordially invited to meet at the homes of several of the members and chose the home of the Burches as most accessible. There were 13 members present and one visitor, Mrs. M.A. Wright, mother of Dr. Wright.

There being no official business the talk schedules for the evening was taken up by E.P. Chace, his subject being Chitons of Australia. Of itself, the subject was bound to be of interest, since most of the dwellers on both sea and land seem to have fashions of their own in that far away land, and the chitons proved no exception. He had a remarkably large number to come from so far away. Some were beautifully marked, looking like finely-wrought jewels, and a number of them, that lived on grass or kelp stems, were so slender they hardly looked like chitons at all, as we find them here.

When we had finished studying and admiring them we had still another treat awaiting us, for Dr. Wright had brought us a goodly number of shells he had collected while in the service in the Pacific war zones. These beautiful collections gave quite an Oriental flavor tot the program that was further enhanced by an aroma of " Java" with which our hostess surprised us when she served refreshments. Our departure was not as prompt as usual but we finally did adjourn.

Effie M. Glark, Secretary.

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W.P. Cook, 2966 Union Ave., San Diego 1. advises that it is still impossible to get out on Point Loma collecting. Of course, this is directly under the fort and understandable in war times. The last we heard it was also impossible to go collecting in Morro Bay. If any of the members know about Morro please let us know. It would be a tragedy not to be able to collect there.

Mr. and Mrs. E.B. Wilkins of Long Beach announce the arrival of Charles Henry Blakley on May 30, Wt. 6 lbs., 10 Oz. We trust that he will carry on and be an enthusiastic shell collector in time.

We wish that one of the local museums or universities or our public library would purchase the set of Martyn now offered by Dawson's Book Store, 627 South Grand Ave., Los Angeles 14. We areat this time arguing about the validity of the Martyn names, and as far as I know there is not a set in all of southern California available for study. Dawson lists this set as #428. Martyn, Thomas. The Universal Conchologist. Figures of Non Descript Shells Collected in the Different Voyages to the South Seas Since the Year 1764. 160 plates containing 328 colored figures, 2 engraved plates of medals, colored frontpiece, 4 volumes bound in 2, 11 x 13½ inches, contemporary straight grain red morrocco gilt, gilt edges, binders ticket of C. Kalthoeber, London, 1789. Price $250.00. The plates were painted by Martyn himself..The figures are really water color drawings and form the most beautiful known representations of shells. The shells were collected by several officers of the ships under the command of Captains Byron,Wallace,Cook and others ... Each shell is identified and the places of origin ... Martyn has ten young artists to help him with his work as described in the text (which is in both English and French) but the project was very costly. A complete set such as this is in four volumes is very rare. Evidently Martyn only completed copies to order. Sir Joseph Banks was unsuccessful in endeavoring to obtain the entire work.

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Chester W. Melville, 20 Hammondswood Rd., Chestnut Hill, Mass. We have just returned from a few months visit to Ft. Myers, Fla. I collected at Sanibel Island,also Marco Island but found the collecting very poor all winter ... I am entering the hospital this week for my operation on my eyes for cataracts. I hope next winter to do some collecting in the Bahamas and Cuba.

Beatrice Hodge, Spindrift, 1663 North Atlantic Blvd., R.R.2, Fort Lauderdale, Florida. " L.A. Bury did a days dredging for us and we found some rare things at different depths. Several will be sent to Harvard to be identified. A piece of Ficus carolae Clench (Johnsonia 18:3), 150 ft. Hillsboro, 1 whole a and 1 piece, so far all of this new species dredged here. 1 rare Lolilia acrilla in perfect condition, 250 ft. Hillsboro. 2 rare Murex micromeris Dall, 7 mm. 1 perfect Pecten tereinus Dall in 125 ft. 1 Umbraculum , 1 Pecten phrygium, 1 Pecten mildradae, 2 Pecten nodosus, 2 Pecten zic zac. "

M.K. Jacobson,455 B,139 St., Rockaway, N.Y. We were pleased to receive a set of Phytia myosotis Drap. collected by Mr. Jacobson at Cold Spring Harbor, Long Island, N.Y., on pier pilings. I have been interested in this species because there is a great question whether or not the Pacific coast species we usually label Phytia setifer Cooper is not conspecific. It is our opinion that they are the same species.

Mr. and Mrs. E.V. Edmonds, 1933½ Russell St., Berkeley 3, Calif. This is the new address of the Edmonds family.

Mr. Edward P. Burch, We were grieved to hear of the death of Mr. Burch of the Minnesota Museum of Natural History,University of Minnesota.

Mrs. Agnes E. Wolf, 829 W. Grand Ave., Pt. Washington, Wisconsin. We are glad to add Mrs. Wolf to our list of correspondents.

Miss Verna Mann,3030 Thornton Ave., Burbank, Calif. Regrets her inability to attend meetings because of a weekly engagement for tuesday evenings.

Marshall Sohl Jr. Big Creek, California c/o Edison Electric Co. New address of Mr. Sohl, formerly of Gardena.

Miss Mary Nimitz, Admiral's House, Naval Observatory, Washington,D.C. is the latest address.

Dr. B.R. Bales, 149 West Main St., Circleville, Ohio. Doc writes that while he has been 'under the weather' since last winter he is beginning to feel much better now and hopes to get backat his shells again now.

[illegible] er,770 Fifth Ave.,New York [illegible], N.Y. " [illegible]
[illegible]
[illegible]
[illegible] motion picture under the sea and to collect shells."

Ralph W. Jackson,Rt.1,Cambridge,Maryland. Mr. Jackson writes that while his collection is limited to land shells, our Minutes have led to many pleasant contacts, and then too he says he knows that sooner or later we will run out of marine talk and turn to land shells.

Mrs. Elmer Stickler,Box 121, Rt.2,Fairmont, W. Virginia. is interested in buying shells.

Dr. W.J. Clench,Museum of Comparative Zoology, Harvard College. " Abbott arrived here last thursday- just out of the Navy. He has two courses to take this summer then enters the graduate school in Sept. At the start he is going to work on medical snails. My dept. now has 9 part and full time members- so we are again in the full swing of things. We hope to put out 120 pages of Johnsonia each year- and 150 of Occasional Papers. Other pieces of research will be published in various periodicals. No trips in sight at the moment but I hope to get into the West Indies again by next summer."

Dr. W.P. Woodring,Geological Survey, Washington, D.C. "Though I have not been contributing to your discussions since returning to Washington, I am greatly interested in your valuable publication." Thank you, and also for the check.

George L. Harrington,566 Washington Ave.,Palo Alto, Calif. We are pleased to add Mr. Harrington to our mailing list.

Professor A.S. Duckworth, Southeast Missouri State Teachers College, Cape Girardeau, Mo. Is still in pursuit of the microscopics in the dredged material. He sent me some beautifully mounted slides of specimens from the Redondo submarine canyon. He has in his collection now over 4000 mounted slides and has given a great deal of material to both institutionsand individuals.

W.J. Bower,340 3rd St. S., St. Petersburg 5, Fla. " I have just returned from a shelling trip down the west coast of Fla. and down on the Keys- a lot of hard work, a lot of fun, and some nice shells. My companions were Capt. Arthur Haas, the new Pres. of our Shell Club,and his sister Miss Edna Haas. They are now on their way motoring to Calif. and intend to call on you. If you can, please get them a bit of field collecting." We shall certainly be looking foward to the arrival of Capt. Haas and sister.

Mrs. Fred La Rue, 405 S. 12th, Clinton, Oklahoma. Is interested in buying shells.
Mrs. Helen Roberts, 757 11th St.,San Diego, Calif. " " " ."

Ralph O. Fox,1048 Monterey Ave.,Berkeley 6, Calif. Mr. Fox is working on the Acmaea . He has lab. space and equipment at the Univ. of Calif. We expect him to have some more to say on this family. Many of us are unhappy about some of the recent conclusions in this group. " Spent several hours knocking around Bodega Bay looking for some Japanese Acmaea which Dr. Light said had been introduced with Ostrea spat- but don't think we found anything."

Harold Harry, Hopkins Marine Station, Pacific Grove, Calif. Local address is 270 Central St., Pacific Grove. He writes that he is now attending classes at the Hopkins Marine Station taking Embryology of Invertebrate work. " At Dr. Berry's home I spent most of my time working on the land mollusca of the Ryukyu Islands,and find the literature a veritable mountain, but scattered as the sands of the desert. I have a rather nice series of 16 species of lanf things from Ie Shima that was the stimulus for that; there may be a new subspecies of so, and I am fortunate in having anatomical material of one or two. .. Am planning on Stanford for the fall, if I can find a place to live."

W.J. Eyerdam, 7531 19th Ave.,N.E., Seattle 5, Wash. is again on his way north to the Alaskan herring fisheries and will collect in his spare timeas usual. We expect to hear of interesting finds as in other years.

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

September 1946

These papers are published by a group of interested students for our own pleasure. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, any person or institution will receive all papers published by our club by contributing $2.50 per year or more to our fund. Expenses are defrayed by voluntary contributions of members and friends.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news about shells to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

This issue is being mailed a little early because it is probable that the editor will be called east on a business trip in September.

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The editor and a few friends have been investigating the idea of doing some dredging and collecting. We have no boat of our own and a very limited amount of tackle, dredges, trawls etc. The expense of chartering a boat and equipping an expedition with proper tools is considerable. We have been thinking about offering shares in the catch on a fair pro rata basis to anyone who might care to take a chance on a part of the dredgings. It would seem fair to allow those of us who do all of the workand use the tackle, sort the shells etc. to get our share for the effort and divide the catch among those who financed the fee charged for the boat. The details have not been worked out. If interested let the editor know. We had an idea of wworking it out so that anyone interested could get a share for **a contribution to** the expenses.

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More collectors should buy the " Tide Tables Pacific Oceanand Indian Ocean", Serial No. 674, U.S. Department of Commerce, Coast and Geodetic Survey, Washington, D.C.

This book is published annually, contains over 400 pages and gives the tides from Cape Horn to the Arctic on this coast as wellas elsewhere. There is a similar book for the Atlantic Ocean. The cost is a mere 25¢ and about as well spent as any two bits a shell collector ever spent.

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We are now working on a complete index to our papers to date. This will cover the Pelecypoda, Scaphopoda, Gastropoda, Amphineura. It is suggested that you bind this up after receipt of the index. This will probably be late this fall.

Our next project will be to cover the fresh water fauna.

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THE CHITONS

Edited by Allyn G. Smith

Introduction

Chitons are mollusks with an articulated shelly armature consisting of eight parts, or valves, imbedded or held in place by a girdle of tough muscular tissue. They are grouped in the Class Amphineura. Dall, in Bull. 112, places them as a subclass of the Class Gastropoda. Whether this was by design or otherwise is not known as most other authers give the Amphineura a status equal to the other four molluscan Classes (Pelecypoda, Scaphopoda, Gastropoda, and Cephalopoda), which is the arrangement believed to be the proper one to follow.

The Class Amphineura is divided into two orders- the Polyplacophora, or chitons, and the Aplacophora, which are worm-like, shellless, and generally live at considerable depths.

The Order Polyplacophora is well known to West Coast collectors for the interesting variety of genera and species that live between the tides or at moderate depths from which in some localities they may be dredged in quantity. In a paper presented in 1939 before the Sixth Pacific Science Congress, Taki states that the chitons in the Pacific Ocean area number about 630 species, divided into 7 families and 92 genera.

The name Polyplacophora is not universally accepted. Iredale and Hull 2, in their monograph of the Australian chitons, refer them to the Order Loricata and call them loricates. They date the use of Loricata to Schumacher,1817 3 and present their case for the use of this terminology in the opening paragraphs of their monograph. The case for the use of Polyplacophora is presented by Dr. S.S. Berry in a recent instructive paper " Chitons", Their Collection and Preservation" 4 in the December issue of ' Mollusca', published by Paul H. Reed of Tavares,Florida. Theile, in his ' Handbuch' published beginning in 1929 5, uses the Class Loricata , which he divides into the Orders Lepidopleurida and Chitonida.

Classification

As may already have been surmised from the above, the classification of the chitons is still in an extremely plastic state, not only with respect to the major divisions but also to the remaining subdivisions from Families down to Subgenera and Sections. Nearly every student of them has proposed an improved system, dating from Carpenter's MS., which he left unfinished at the time of his death. Dall had access to this and used it extensively in an important report on the limpets and chitons of Alaska 6, which was published in 1879. Pilsbty in the Manual of Conchology 7, put the group in good working order in 1892 and 1893. Both Dall and Pilsbry validated many of Carpenter's MS. names and descriptions, but unfortunately for the careful work Carpenter had done, under the existing Rules of Nomenclature these must be attributed and dated in accordance with the authors who subsequently gave them valid standing.

Working with the radula of chitons as a principal basis, Thiele made some changes in Pilsbry's arrangement in the Manual and to some extent these are reflected in Dall's classification in Bull. 112. Subsequently, beginning in 1923, Iredale and Hull in their work on the Australian chitons made several additional changes but as they consider the Australian forms unique in a large number of instances, their arrangement is of little assistance in the classification of West Coast species. While it is not the [illegible] systematic [illegible] particularly [illegible] Dall in Vol. 14, several changes [illegible] been suggested by Dr. S.S. Berry, of Redlands, California, whose detailed knowledge of the group has been justly recognized. Where changes are made in Dall's classification the reasons for them will be stated.

Those interested in the history of the classification of the chitons will find most of it in Volume 14 of the Manual of Conchology, pages xiv--xxvi. An up-to-date classification is given by Thiele in his " Handbuch der Systematischen Weichtierkunde", Volume 1.

The Shell of Chitons

In discussing or describing chitons a special terminology had to be developed in order to call attention to the peculiarities of their shell forms and structure. Explanation of the terms more commonly used appear in a number of papers or monographs, the principal ones being as follows:

1. Dall, W.H.- Limpets and Chitons of the Alaskan and Arctic Regions with Descriptions of Genera and Species believed to be New- Proc. USNM,1878,1(48):283-285 (Published,1879). Terminology somewhat outmoded but included good figures.
2. Berry, S. Stillman- Fossil Chitons of Western North America- Proc. California Acad. Sci., 4th Ser., 11(18):422-424, May 16,1922. The best account but lacks illustrations.
3. Pilsbry, Henry A.- Manual of Conchology, Polyplacophora,14:vi-xii, figs. 1-4. A complete, though detailed account, with good illustrations.
4. Iredale and Hull- A Monograph of the Australian Loricates- Australian Zoologist, 3(#):187-189, figs. 1-4. Figures excellent showing sculptural variations in both shell and girdle.

The following definitions, taken principally from Berry, may be found helpful:

Valve (or Plate)- One of the eight " shells" of a chiton.
Head Valve- The anterior valve
Tail Valve- The posterior valve
Intermediate (or Median) Valves- The six valves between the head and tail valves, numbered 2 to 6, inclusive, from the head valve.
Girdle- Leathery muscular tissue, variously ornamented or plain, in which the valves may be slightly, partially, or wholly imbedded, and which holds them in place.
Tegmentum- The outer, usually softer surface layer of a valve.
Articulamentum- The inner, usually hard, semi-porcellaneous shell layer, which projects past the tegmentum on the sides and front of the valves to form the sutural laminae and the insertion plates.
Lateral Area- That portion of the tegmentum of an intermediate valve, often triangular in shape, lying at the side and toward the anterior, usually sculptured diagonally and set off from the central area by a diagonal ridge.
Central Area- That portion of the tegmentum of an intermediate valve lying centrally and usually differeing in sculpture from the lateral areas.
Terminal Areas- Tegmentum surface of head and tail valves.
Jugum- The longitudinal ridge of a valve, when present.
Jugal Tract- The surface of the tegmentum adjacent to the jugum.
Pleural Areas- Side slopes of valves, not including the jugal tracts.

[illegible] species the boundaries [illegible]
are more distinctly separated than those of the lateral areas (i.e., the sculpture of the pleural areas is much the same throughout).

Beak- A posterior angular projection of an intermediate valve at the jugum. When this exists, the valves are said to be mucronate.

Falso Beak- A similar forward projection of the tegmentum between the sutural laminae.

Eaves- Portions of the tegmentum just over the points where the insertion plates push from under it.

Eave Tissue- Character of the shell tissue of the " little cliffs" that form the eaves. It is sometimes porous or " spongy".

Insertion Plate- Narrow marginal extension of the articulamentum of a valve projecting into the girdle.

Sutural Laminae- Sharp, plate-like projections of the articulamentum from either side of intermediate and tail valves, which are overlapped by the preceding valve when in normal position.

Jugal Sinus- The " bay" or depression between the sutural laminae. Sometimes called the sutural sinus.

Posterior Sinus- The embayment in the anterior median line of a tail valve. It is formed by the tegmentum and sometimes also by the articulamentum.

Slits- Abrupt indentations in insertion plates.

Teeth- Portions of the articulamentum between the slits, usually most prominent in the tail valves.

Slit Rays- Slight grooves, or rows of pores that run from the slits toward the apex of a valve.

The surface of the girdle may be ornamented with scales (which may be flat or rounded, dull or polished, smooth or striated, and spaced regularly or irregularly); with calcareous spines (which may be uniform, irregular, straight, or curved); with spicules ; with hairy or bristly processes (which may be widely spaced and set in pores or closely set and bushy, simple or branching); or with a combination of such ornamentation. In the genera having a posterior sinus in the tail valve, the girdle has a corresponding sinus or slit.

The slitting of the insertion plates and the covering of the girdle, as well as certain important radular and other internal characters, form the principal bases upon which chiton genera are founded. In determining species it is therefore desirable to disarticulate specimens of a species that is difficult to determine. Valves may be carefully slipped out of the girdle and mounted in sequence, on narrow glass slides with a small drop of clear cement, which permits them to be studied in detail. Smaller specimens, when so treated, may be protected by placing them in glass vials or glass-topped boxes. In preparing mounts of this sort, no amount of care should be spared to keep from chipping the insertion plates, sutural laminae, or other delicate parts of the valves. As recommended by Berry, the girdle and the remaining part of the animal should be preserved in alcohol and labelled so that the valve-mount may be associated with the rest of the chiton from which it came.

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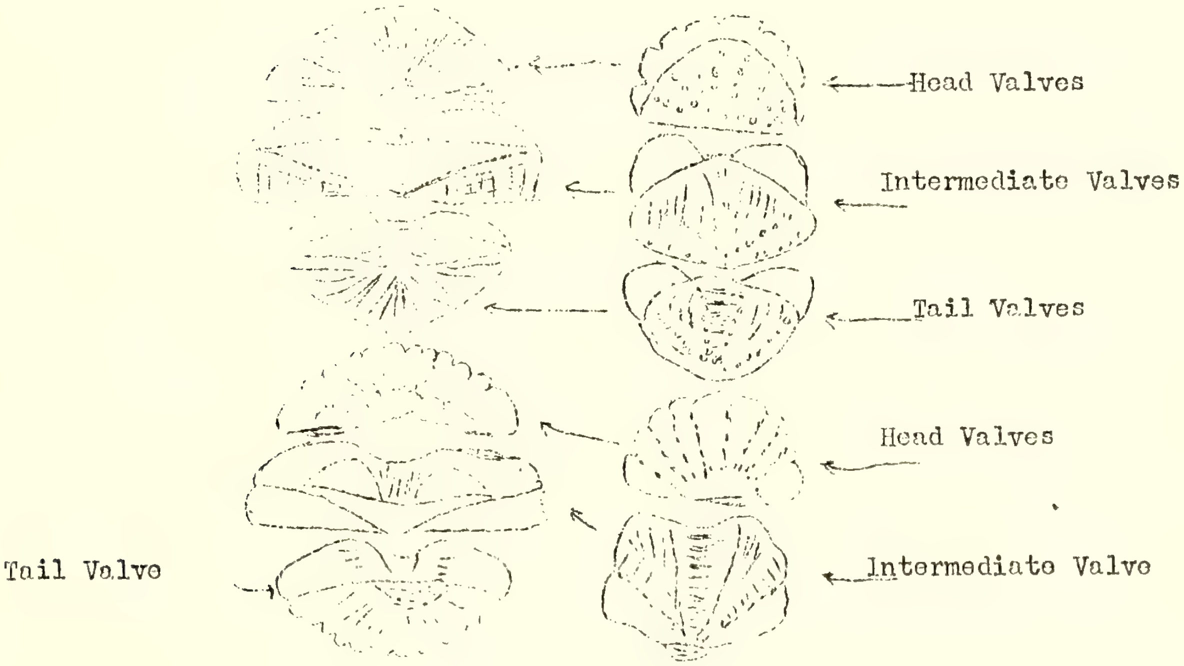
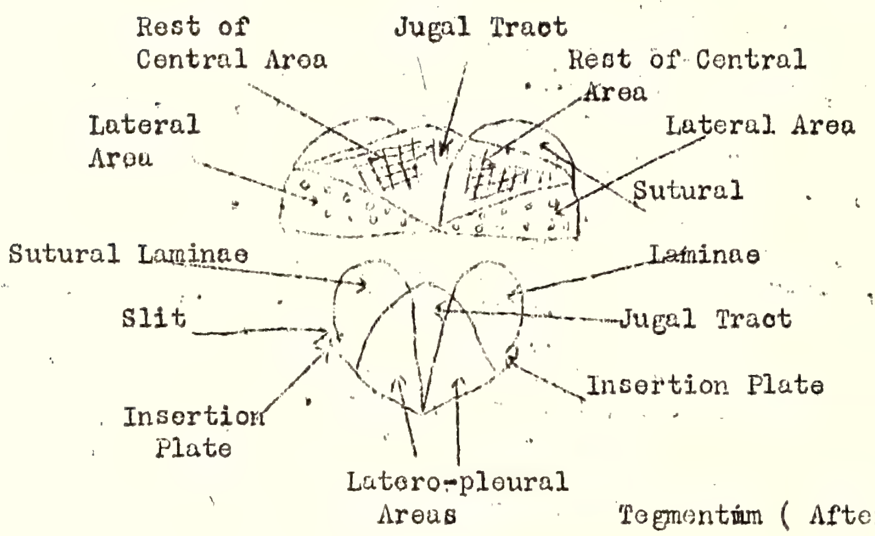
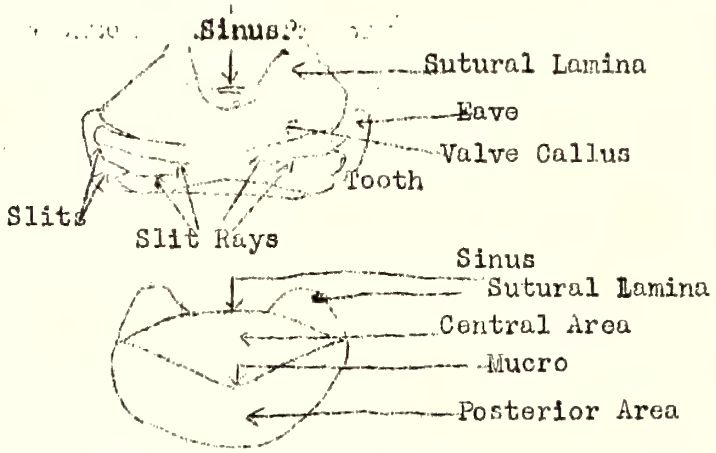
Shell Structure of Chitons



After Dall


Rest of Central Area
Jugal Tract
Rest of Central Area
Lateral Area
Lateral Area
Sutural
Sutural Laminae
Laminae
Slit
Jugal Tract
Insertion Plate
Insertion Plate
Latero-pleural Areas

Tegmentum (After Pilsbry)


Sinus
Sutural Lamina
Eave
Valve Callus
Tooth
Slits
Slit Rays
Sinus
Sutural Lamina
Central Area
Mucro
Posterior Area

Articulamentum (After Pilsbry)

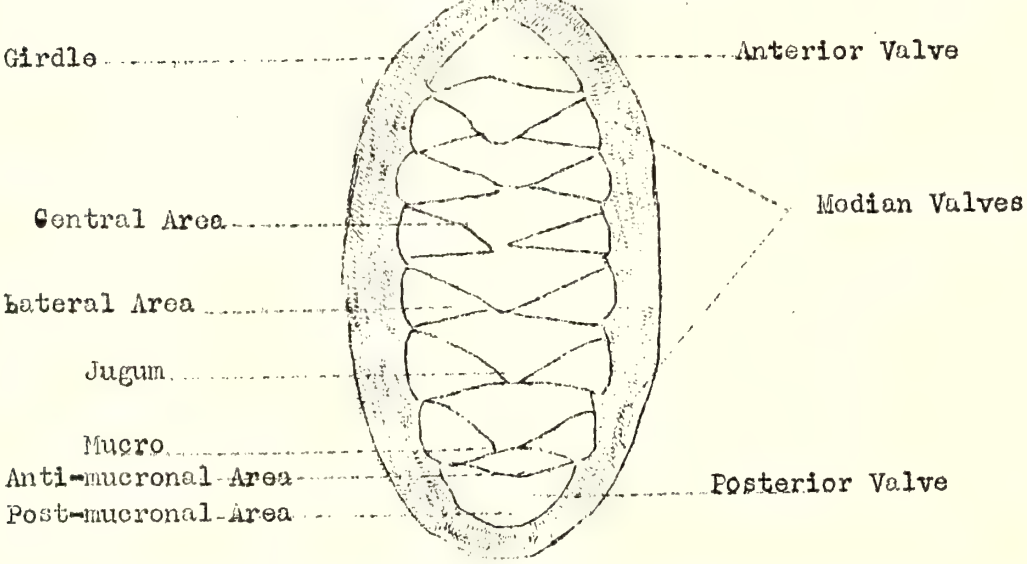
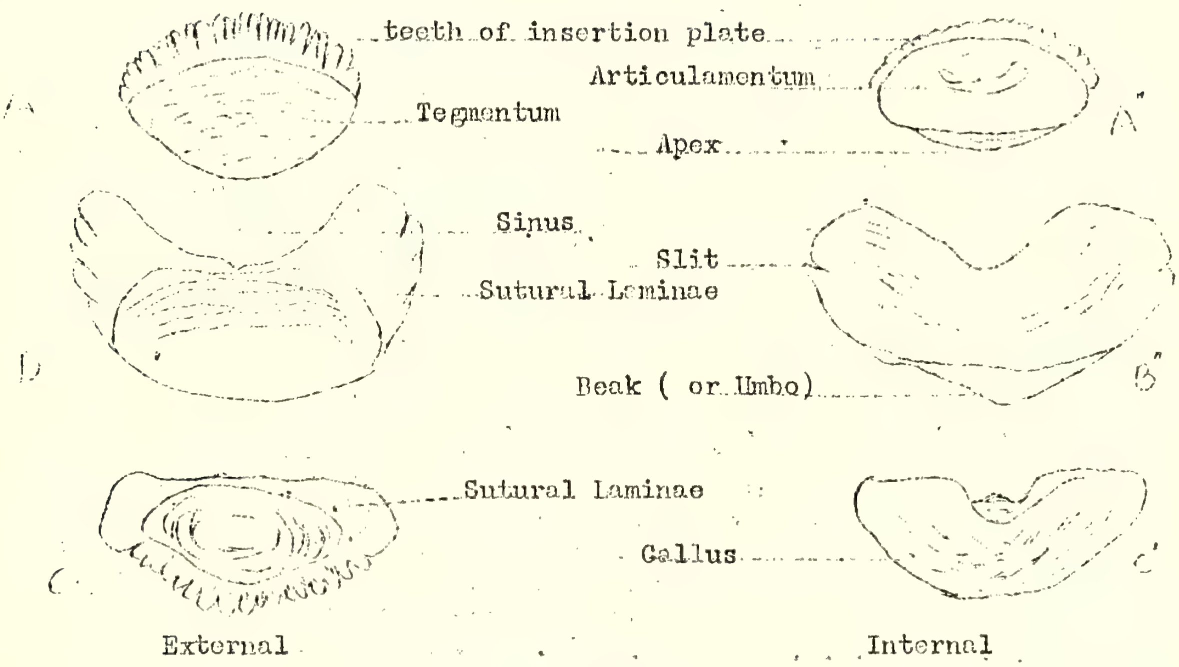

Girdle
Anterior Valve
Median Valves
Central Area
Lateral Area
Jugum
Mucro
Anti-mucronal Area
Post-mucronal Area
Posterior Valve

Diagram of Chiton Showing Parts (Iredale and Hull)


teeth of insertion plate
Articulamentum
Tegmentum
Apex
A
A'
Sinus
Slit
Sutural Laminae
B
Beak (or Umbo)
B'
Sutural Laminae
Gallus
C
C'
External
Internal

A,A'- Anterior Valve
B,B'- Median Valve
C,C'- Posterior Valve

(Iredale and Hull)

The chitons will be continued in our next issue.

New Publications Received

Proceedings of the Malacological Society of London, vol.27, pt.1, May,1946.
There are several fine papers in this issue. One very interesting report is by A. Wrigley on the structure of lamellibranch shells. Two long papers by L.R. Cox dealing with English fossil genera and species. A paper on the genotypes of Plotisand Ampulla by R. Winckworth. Three new species of Pleurobranchidae are described by K.M. White.

Fishes and Shells of the Pacific World by John T. Nichols and Paul Bartsch, The Infantry Journal. This interesting little book is the one written for use by the U.S. military forces. The part on shells is from page 115 to 192 with 16 plates.

Fish Bulletin No. 63, The Commercial Fish Catch of California for the Years 1943 and 1944, Division of Fish and Game,California. The amounts of shell fish reported from California is somewhat amazing. For an example in the year 1944 alone they report 1,630,402 pounds of Abalone. Other items are equally surprisingly large.

Holiday, July,1946 contains a write up on shells which may be of interest to those concerned with articles written for the public.

Mollusca,vol.1, no.9, June 1,1946. There are several papers in this issue well worth comment. " Insect Pests of Conchological Collections" by Gordon E. MacMillan should be read by all collectors. " Stage Growth of Family Caecidae" by Athleen Underwood is interesting. Two articles on collecting in New Zealand, one by A.G. Stevenson and one by Arthur Richardson. Mr. C.L. Blakeslee gives an account of collecting in the Niagra River.

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F.E. Shafer,R.R.1,Trenton, Ohio. Mr. Shafer writes that he is now getting well over his war damages and hopes to be able to return to the Philippines by the coming September. He is still very much interested in getting conchological literature. He invites correspondence from other collectors.

Dr. Alexander Comfort, 20 Honor Oak Road, Forest Hill, London, SE 23, England. " Can you put me in touch with someone in your area who would exchange local freshwater,landand marine shells. I need specimens of these for research Iam doing." The above letter was written to Mr. Kenneth Rexroth, 692 Wisconsin St., San Francisco who asked Dr. Hanna of the California Academy. Mr. Rexroth says " I gather that Dr. Comfort wants shells from all over the USA and that the research is medical-zoological rather than strictly conchological, but about the latter point, Iam not so sure."

Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. The editorand Mrs. Burch were recent visitors again to Andy's city and again enjoyed his hospitality. He made another fout weeks trip to Guaymas, Mexico and as usual brought back some rather amazing things. Besides large numbers of very fine marine shells he had some specimens of a barnacle labelled Alepas rex . These barnacles has long stems perhaps a foot in length, and Mr. Sorensen said that he found them anchored as deepas 2 inches in the flesh of large black marlin. They were vicious looking things and it was difficult to immagine a barnacle being so destructive. We understand that this species is quite rare even in the larger museums. Andy seemed to have a number of them in case there are those interested in this group particularly. He also took a large number of barnacles from the large green t turtle.

[illegible] in this issue, but only one dealing with the fauna of this [illegible]. Sylvia Jacobs discusses finding Pediculariella californica (Newcomb), or rather in her nomenclature the name Pedicularia. We mentioned in our Minutes that Thiele had described Pediculariella differentiating it from Pedicularia on anotomical grounds. We accepted Thiele's name at the suggestion of Dr. Haas of the Chicago Museum of Natural History.

Those of our members who collect land shells in the adjoining states will find the paper by Gordon K. MacMilan " Notes on Some Southwestern Pupillidae" of interest.

Coe, Dr. Wesley R. " A resurgent population of the California bay mussel (Mytilus edulis diegensis), The Journal of Morphology, vol.78, no.1, Jan., 1946, 15 pages of text and two plates of figures. Dr. Coe discusses the Mytilus very thoroughly.

Quarterly of the Los Angeles County Museum, Summer, 1946, vol.5, no.2. This publication contains an article by the late George Willett " Migration of North American Birds". This is a very thorough paper, and in addition there is a photograph of Mr. Willett and a brief account of his life.

The Condor, vol.48, March-April, 1946, no.2, pp.49-71 is an article on the life of George Willett by Hildegarde Howard. It is a fine account and also gives a list of Mr. Willett's scientific publications.

California Fish and Game, vol.32, no.2, July, 1946.

Bulletin Southern California Academy of Sciences, vol.45, pt.1, 1946. G. Willett " Additional Notes on the Pliocene Molluscan Fauna of Los Angeles City". This is a discussion of the fauna at Fourth and Broadway and Fifth and Hope streets. Among the interesting comments is the consideration of a possibility that Chama exogyra may have been both dextral and sinistral in the Pliocene. So far as we know it has never been reported Recent other than sinistral. Mr. Willett notes that Fusinus barbarensis Trask and Fusinus arnoldi Cossmann were confused in the Pliocene, the latter having become extinct after that time. He also notes that the fossil Bittium rugatum seems to intergrade with series of Recent Bittium larum. In the same paper there is a description of a new species of Solariella from the Recent fauna of Alaska. The description will be given on a later page of this issue.

Shell Notes by Frank Lyman, vol.1, no.17, June, 1946. Frank continues to publish the Gilmore book plates and to keep up the interest in his very excellent little paper. If you are not receiving this paper you are the loser. Write Frank Lyman, Lantana, Florida.

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During the war years some interesting papers were printed that are just now beginning to appear in scientific libraries. The following data was furnished by Dr. A. Myra Keen, for use by Allyn Smith.

Notes on Chitons- Papers by Eugene Leloup, Natural History Museum of Belgium.

1. Characteres anatomiques de certains chitons de la cote californienne- Mus. r. d' Hist. Nat. de Belgique, ser.2, fasc. 17, Apr. 30, 1940, 41pp, 94 figs.

(con.)

Figures,especially of the sensory organs (aesthetes) and of the elements of the girdle (ceinture) are given for the following, all from alcoholic material collected by Dr. Giltray in California in 1933.
Lepidopleurus ambustus Dall,L. cancellatus (Sowerby), Ischnochiton interstinctus radians Pilsbry, I. mertensii Middendorff,I. cooperi (Pilsbry), I. clathratus sinudentatus Pilsbry,Lepidochiton hartwegii (Cpr.), and var. nuttallii Cpr., Nuttallina californica (Reeve) and var. scabra Reeve, Chaetopleura gemma Dall,Mopalia heathii Pilsbry,M. muscosa Gould,M.pedroana Willett,M. thamnopora Berry, Katharina tunicata (Wood).

2. Sur la presence d'aesthetes chez Cryptochiton stelleri (Middendorff), 1846,- Bull. Mus. r. d' Hist. nat. de Belgique, tome 16, no.36, May,1940, 7 pp. 2 pls., 2 figs.

In this paper Leloup shows that although sense organs (aesthetes), may be lacking in the adult, they are present in young specimens.

3. A propos de quelque acanthochitons peu connus ou nouveaus,III.-- Region Pacifique, Cotes Americaines- Ibid., tome 17, no.61, October,1941, 9 pp, 1 pl., 4 figs in text.

Describes as new Acanthochiton coquimboensis, from Coquimbo,Peru; and discusses A. exquisitus from the Gulf. Also describes A. peruvianus. n. sp. from Peru.

4. Contribution a la connaissance des Polyplacophores-- Famille Mopaliidae Pilsbry,1892- Mem. Mus. r. d' Hist. nat. de Belgique, ser.2, fasc. 25, December 31,1942, 64 pp, 6 pls.

Catalogue of all described species of Mopalia, with discussion of material in the Belgian Museum. Figures of spines and bristles of several West American species (sinuata,acuta,porifera,etc.) are given, along with those of some related species.

5. A propos de certains chitons du genre Tonicella- Bull. mus. r. d'Hist nat. de Belgique, tome 21, no.4, Jan.1945, 15 pp., 12 t. figs.

Reports T. rubra (Linne) from Unalaska (sent to him by Eyerdam). Leloup considers submarmorea to be at least in part a synonym of T. rubra He discusses four species: rubra (Linne), insignis (Reeve), marmorea (Fabr.) and lineata (Wood).

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Mr. Allyn Smith,722 Santa Barbara Road, Berkeley mentioned " The Waltons were at the house last night, looking over land and freshwater shells until a late hour. They are on their way north, perhaps as far as Canada, collecting shells and butterflies as they go."

William Henry Fluck,80 Oak Grove Ave., Brattleboro,Vermont. " Thank you most sincerely for he Minutes. It is a most informative publication. Through it I re-discovered a friend of 50 years ago, Mr. Morris Schick and by it I am straightening out my shell nomenclature. I have moved from Newfane,Vermont."

Mr. E. Sidney Marks, 655 Kearney Ave., Arlington, New Jersey. We were happy to have a note from Mr. Marks with whom we exchanged many shells some years ago.

Paul P. McGinty, Boynton Beach, Fla. " ... would like to say that you are doing fine work with your monthly reports. Best of luck for continued success. ... Last week the boys returned from a collecting trip down as far as Key West, Fla. and had very good results. They found our first specimen of Mitra florida and this we were more than pleased to add to the collection."

Joseph S. Gaylord,E. Longmeadow, Mass. (May to October), the rest of the year St. Petersburg, Fla. " Your club is doing a great service for those who are interested in shells."

Extended Geographic Ranges of Cataloged [illegible] Mollusks
collected by Walter J. Eyerdam.

Mr. Eyerdam published lists of range extensions in the Nautilus, vol. 51, Jan. 1938, no. 3, page 100 and also Nautilus vol. 51, April, 1938, no. 4, p. 122.

The following are shells not included in the above lists.

Diadora inaequalis inaequalis Sowerby- Talara, Peru. Extension of range about 300 miles southward from Manta, Ecuador.

Cerithiopsis stejnegeri dina Bartsch, 1911- Drier Bay, Knight Island, 1923. Extension of range northward about 800 miles from Sitka, Alaska.

Cerithiopsis stephensae Bartsch, 1909- Shuyak Strait, Afognak Island, Alaska. Extension of range northward from Port Frederick.

Bittium eschrichtii Missendorff, 1849. Drier Bay, Knight Island, Alaska. Extension of range northward from Sitka, Alaska.

Neptunea satura Martyn, 1784- At mouth of Yenisei River, Arctic Ocean-Nordenskjold Expedition, 1878- Voyage of the Vega- Extension of range about 3,000 miles westward from Bering Strait.

Lora althorpensis Dall, 1919. Shuyak Strait (1924), Afognak Island, Alaska. Extension of range N.W. from Granite Cove, Port Althorp, Chicagof Island, S.E. Alaska.

Lora miona Dall- Unalaska, Aleutian Islands, 1932. Extension of range westward from Boca de Quadra, Alaska.

Lora alitakensis Dall, 1919. Shuyak Strait, Afognak Island, 1924. Extension of range about 75 miles eastward.

Lora pyramidalis Strom- Akutan Island, Aleutian Islands, also Tromso, Norway. New to Alaska.

Lora reticulata Tr. - Akutan Island, Aleutian Islands. New to Alaska.

Turbonilla eyerdami Bartsch, 1927. Hinchinbrook Island, Prince William Sound. Extension of range eastwardacross Gulf of Alaska from Shuyak Strait.

Turbonilla (Pyrgolampros) eschscholtzii Dall & Bartsch, 1909- Izhut Bay, Afognak Island, 1922. Extension of range N.W. from Port Simpson, B.C.

Odostomia chinooki Bartsch- Mud Bay, Thurston Co., Wash. (on Ostrea lurida) Extension of range northward from Columbia River, Oregon.

Odostomia (Amaura) pesa Dall and Bartsch, 1909. Drier Bay, Knight Island and Raspberry Island, Kodiak Islands. Extension of range northward and westwardfrom Sitka, Alaska.

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Haliotis wallalensis- Mr. Andrew Sorensen reports the following records either of which are extensions of the published range- South of Monterey, Calif. in 100 ft. and off Pt. Buchon, San Luis Obispo County, Calif.

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Lyonsia californica haroldi Dall- We published the range of this species as being from Morro Bay north to San Francisco Bay. However, on a recent collecting trip with Mr. Allyn Smith I was informed by Allyn that this form is very common in Tomales Bay, and just to prove it I stopped and collected several typical specimens as well as a handful of Cerithidea Californica Haldeman as this is the farthest north this species has been reported. The specimens seemed typical. We also did a little land shell collecting that afternoon . Perhaps the most interesting catch in this line were the Helminthoglypta nickliniana awania (Bartsch) and H. arosa miwoka (Bartsch) from Point Reyes on June 16, 1946. The only thing of any particular note about this excursion was that Allyn and I parked the car comfortably in the lee side of the point leaving Mrs. J.Q. Burch there. We then after getting permission from the lighthouse officer in charge went down the ocean face of that cliff on narrow little trails with the wind just short of a hurricane. After risking life and limb we collected perhaps 40

(con.)

[illegible] a few feet of the [illegible] [illegible]
Haplotrema minima at the same locality.

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Dr. Joshua L. Baily Jr. (Personal Comm. June 12,1946) makes some very interesting comments on several species and problems. " ... on the Haliotidae. This is a peculiar family. Most modern taxonomists are splitters in every other family but lumpers in this one. To me it seems foolish to recognize so many species among the small shells like the Pyramidellidae which I [illegible] so much alike, while ignoring such forms as Mrs. Williamson's *Haliotis splendidula* which to my mind is a thoroughly good species because it is so unlike any other species. Of course, it may be that the shells that we call *H. splendidula* are really something else- but in any case what we have is the most plentiful of all species of this genus on the coast- and quite distinct- so that whatever its name is, it should not be ignored. Another thing- it seems to be fashionable today to write *Haliotis cracherosii holzneri* and *H. c. lusus*- but again they are widely different. We have the types of *holzneri* and they are pathological specimens- all of them. The specimen which Mr. Kelsey wrote up in the Nautilus the year before Hemphill described *holzneri* was an alotgether different thing. I was in Holzner's store when he found this shell in a shipment of shells from Baja California and gave it to Mr. Kelsey. I was the first person to see this shell after Mr. Holzner and Mr. Kelsey. It was a very different thing- perfectly normal which had no indication whatever of ever having had holes. It is probably a good variety, but could be easily considered a species, and the form which Orcutt called *bonita* is a very interesting form because it is physiological.

The best collection of abalones I have ever seen is that which was made by Mr. Cass and which now belongs to me. When I get it out of storage I hope I can add to it and obtain some of the forms which I do not have- t the form of *H. fulgens* without holes- the form with two parallel rows of holes- th true " green abalone", etc. Eventually I shall have some of these photographed, and perhaps write an article about them at that time.

Article 19 of the code reads " The original orthography of a name is to be preserved unless an error of transcription, a *lapsus calami*, or a typographical error is present." Inasmuch as *Mangelia* was named for Mangili I assume that a *lapsus calami* is evident. Furthermore Opinion 26 authorizes the correction of *Cypsilurus* to *Cypseluris* because the former is an obvious typographical error, and Opinion 27 corrects *Ruppelia* and *Rupellia* both to *Ruppellia* not by suspension of the rules under the plenary power which the commission holds but by application of the rules.

Of course, Petit named a common species of *Polinices* after Recluz, but he called it *reclusiana* instead of *recluziana* because he felt that the letter "z" had no place in Latin and should be used only in words of Greek origin. Some later writers have assumed that this was a typographical error and have spelled the name accordingly, but there is no justification for this. In the case of *Mangilia*, the spelling with the "e" is no more or less acceptable as Latin, but as the man whom it was named for was called Mangili I have accepted the corresponding spelling.

(con.)

As [illegible]'s [illegible], [illegible] [illegible], it is quite rare, probably no [illegible] in the U.S. and no two of these agree in all respects. Perhaps it should be supp-ressed for that reason. But it seems likely that the differences between them may be due to the omission from one copy of material that is included in another, and not to contradicting statements made in material common to two copies. Personally I do not think a work should be rejected because it is not consistently binomial. We already have a rule that names which are not binomial are not available, therefore acceptance of Martyn means acceptance only of his binomial names; I can see no objection to that.

Suppose a writer prepares a treatise dealing with a limited number of forms in which he uses the binomial system. Suppose he then prepares a similar treatise in which he does not use the binomial system, dealing with a limited number of closely related forms. These two are sent to a periodical for publication. Seeing that they are dealing with closely rel-ated forms the editor unites them into a single document and publishes them. Then since about half of the names used are not binomial the work is discarded by those who hold that works which are not consistently binomial must be rejected.

Now suppose that the editor instead of publishing the two documents as one, puts them in different issues of his periodical. The one will be accepted, the other rejected. Yet the one that was accepted does not differ in any way from the form which it had under the first " hypothesis"- and so the futility of deciding what works are not consistently binomial is demonstrated. The Conchylien Cabinet of Martini and Chemnitz is in this category. Some of the volumes have been accepted as consistently binomial- some have been rejected as not. But doubtless the rejected volumes contained some names that were as good as those in the accepted volumes- and thus they were rejected therefore as the result of the incident, if not the accident of binding. If all the volumes had been accepted, the non-binomial names would have been eliminated by application of the rule that requires all names to be binomial: by rejecting entire volumes the baby is thrown out with the bath water.

If the International Commission should reject Martyn in the same way as it has already rejected Humphrey and Bohadsch and should have rejected Bolten, the question as to whether Martyn's names should be used will be settled automatically, but when such action is taken it will have to be by suspension of the rules. Therefore until such time I think we must use those of Martyn's names which are good. Probably what will happen will be that Dr. Keen or someone like her who has access to Martyn's work, will as the International Commission for a decision (I would not think of doing so, since I do not have opportunity to examine the work) and the Internat-ional Commission will then reproduce some sample pages of Martyn in the Bulletin of Zoological Nomenclature, so that people like you and me can examine them and express our opinions to the Commission, who will then weigh all the opinions they receive and from them formulate their own, which will then determine the matter.

The rejection of Martyn's names will cause a great deal of confusion- so would their acceptance. I think the most satisfactory solution would be to list Martyn's names and by popular vote reject some and accept others by plenary suspension of the rules.

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Dr. Thomas A. Burch, National Institute of Health, Bethesda, Maryland.
The above is Tom's address at this time.

[illegible]

[illegible]

[illegible] to Schrieli [illegible] varices high. [illegible] whorls carinated instead of rounded, varices fewer (15 instead of about 20), and inside of wide umbilicus spirally striate. Body whorl with two strong keels at the periphery, another at the summit, and a much fainter one a little in front of the suture. Whorls on the spire with single keelat the summit. Varicies continu-ous from spire to umbilicus, except for interruption by the double keel at the periphery of the body whorl; the strong keelat the summit is crossed and rendered nodulous by the varices. Base flattened, with about 17 fine, spiral cords. Operculum normal for the genus. Color of outside dusky with greenish sheen between the varices. Aperture subcircular, obtusely angulated on the outer lip by the peripheral keels and on the inner lip by the umbilical keel. The penultimate whorl is somewhat like that in the illustration of Cidarina carlotta Dall(U.S. Nat. Mus. Bull. 112, pl.18, fig.4), but the base and aperture are very different and the varices cross the keel at the summit.

The type, a dead specimen, No. 1084, Los Angeles Museum, was collected by Mr.and Mrs. Fred E. Lewis in 15 fathoms, at Spiridon, Kodiak Island, Alaska; a ypunger, living specimen was dredged in 15 fathoms at Galena Bay. The type has 4 3/4 whorls, and measures: Diameter, 6.1; alt. 5 mm."

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Dr. Louis Brand, University of Cincinnati has submitted the following list of shells collected in 1945 at Mayaguez, Puerto Rico.

Cymatium femorale Linne, Fasciolaria tulipa Linne,Cymatium tuberosum Lam., Cymatium aquitile Reeve, Turbo castaneus Gmelin,Cerithium atratum Born, Astraea caelata Gmelin,Livina pica Linne,Thais floridana Con.,Tectarius muricatus Linne,Turritella variegata Linne,Murex pomum Gmelin,Conus jaspiseus Gmelin,Conus spurius Gmelin(proteus Hwass),Tegula fasciata Born,Melampus flavus Gmelin,Neritina virginea Linne,Xenophora trochiformis Born,Strombus gigas Linne,Strombus pugilis Linne (juv),Distorsio clathratus Lam.,Oliva reticularis Lam.,Strombus pugilis pugilis Linne,Cypraecassis testiculus Linne, Phalium granulatum Born,Mitra barbadensis Gmelin,Conus citrinus Gmelin(mus Hwass), Littorina ziczac Gmelin,Nerita fulgurans Gmelin,Neritina viridis Linne,Nerita tessellata Gmelin,Nerita peloronta Linne,Cyphoma gibbosa Linne, Natica canrena Linne,Cypraea exanthema Linne,Cypraea cinerea Gmelin,Bulla occidentalis Adams,Trivia pediculus Linne,Archetectonica granulata Lam., Astraea longispina Lam.,Crepisula aculeata Gmelin,Diodora cayensis Lam., Fissurella barbadensis Gmelin,Conus verrucosus Hwass, Diodora listeri d'Orb., Fissurella angusta Gmelin,Vermicularia spirata Philippi,Pyrene rusticoides Heilprin,Capulus ungaricus Linne,Modulus modulus Linne,Conus regius Gmelin, Fissurella punctata Fischer,Tegula semigranosa A. Adams,Spirula spirula Linne,Antigona listeri Gray,Iphigenia brasiliana Lam.,Tellina fausta Don., Arca occidentalis Philippi,Arca secticostata Rve.,Lima tenera Chem.,Macrocallista maculata Linne,Codakia orbicularis Linne,Loripinus chrysostoma Philippi,Laevicardium laevigatum Linne,Chione intapurpurea Con.,Divaricella dentata Wood,Arca chemnitzi Philippi,Tellina lineata Turton,Donax denticulata Linne,Lima lima Linne,Venus mercenaria Linne,Spondylus americanus Hermann,Chama macerophylla Gmelin, Mytilus recurvus Raf.,Echinochama arcinella Linne,Plicatula gibbosa Lam.,Modiolus tulipus Linne,Papyridea hiatus Meuschen (spinosum), Pecten ziczac Linne, Pecten gibbus Linne, Pecten nodosus Linne.

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Minutes of the Conchological Club of Southern California - [illegible]

The Conchological Club of Southern California met at 7:30 P. M., [illegible], 1946, at the Los Angeles Museum. There were 17 members and 3 visitors present. The visitors were John Malloy, 6405½ Victoria Ave., Los Angeles 43, Carl Hegner, 1964 Nolden St., Los Angeles 41, and Annie M. Boyd, 5609 Hunt St., Los Angeles 42. The first two named expressed a wish to become members.

There were no reports of standing committees. An invitation was extended by Mr. and Mrs. E.P. Baker to attend, along with the members of the Long Beach Shell Club, a picnic to be held at their home at 407 Downey Ave., Downey, Calif. The hour of the meeting is to be 2:30 P.M. Sunday, July 14,1946, and one of its features to be a " Shell Auction", the proceeds to be used by the Long Beach Shell Club and the shells to be auctioned are to be donated by those in attendance.

The scheduled subject " Cones of the West Coast of America" by A.M. Strong then followed. Since he did not have a prepared paper and spoke largely from memory, Mr. Strong warned us not to be too definite in our details in reporting it since his memory may have failed him as to some of the items. His memory ' unrefreshed' holds much more than the sum of the knowledge possessed by the rest of us as proven by the fact that few of us know but few cones besides C. californicus, while his list had upwards of 25 species, all illustrated and most of them represented by specimens. This will give an idea as to the interest this talk had for all of us, and we were all glad indeed when he told us that the paper was in the hands of the printer and he hoped would soon be available for study.

There was a lot of time left after the meeting was formally adjourned and before we had to leave, and that was spent in a most enjoyable informal discussion. Effie M. Clark, Secretary.

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Dr. Irene McCulloch of the University of Southern California has been on a trip east. Among other things she plans to make a study of the types of west coast chitons in the national museum.

Dr. Harry S. Ladd, U.S. National Museum, Washington 25, D.C. " I have been out of the country most of the time since November of last year. My address is still the U.S. Nat. Mus. and I hope you will continue to send your minutes there. They are very interesting.

Mrs. Margaret Teare, 681 Lafayette Ave., Buffalo 9, N.Y. "... I hope to do some collecting in Nova Scotia next month. ... hope to receive from my sister who lives in Canada a quantity of Cepaea nemoralis from Lake Hurn vicinity (at Southampton). Would you like some specimens?" The answer is that the editor is always happy to receive specimens.

Mr. R.M. Barnes, Lacon, Illinois. We were grieved to learn that Mr. Barnes passed away last year.

Ted Dranga, c/o Wells Fargo, Mexico,DF,Mexico. Does Ted get around ? I thought he was on a trip to Hawaii and here he turns up in Mexico. It is safe to wager though that he will be bringing some fine shells back to Florida with him.

Miss Marie E. Bourgeois, 3a Tiziano #35,Mixcoac,D.F.,Mexico. This lady is an enthusiastic collector specializing in Pacific Coast and Guld of Mexico material.

Prof. Ignacio Ancona,Instituto de Biologica Chapultepec, Casa del Laga, Mexico, D.F., Mexico. We are happy to add the above name to our subscription list.

E.J. Post, Tampa, Florida. We were pleased to have a long letter from our

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[illegible] did some dredging for small shells last winter [illegible]. He ran into a few specimens of Polygyra jejuna and has been collecting some rather rare Miocene fossils at Ballast Pt. which is about a mile from where his daughter lives. One perfect pair of Chama tampaensis was found, also a large and fine water geode.

Norman W. Gardner, Mauku, Pukekohe, New Zealand. " I am a keen collector of land snails and am anxious to build up my American section hence the inquiry. As yet I have only seven varieties from the U.S. (from Peekskill, N.Y.). For some of your country I can offer you a fair selection of N.Z. ranging from Im.m. (Hydrocena) to three inches (Paryphanta). New Zealand is rather rich in small stuff there being about 200 under $\frac{1}{2}$ in.. Nearly all are from the virgin bush. "

A.W. Fahrenbruck, c/o The United States Truss Co., Cincinnati 2, Ohio. Our friend complains that he dislikes to read about so many fine shells when he is unable to get them for his own collection. I am sure that we have all of us at times had the same feeling. Thanks for he nice compliment ".. the work that is published in the Minutes is outstanding and covers a long felt want in a very thorough manner, and your club, no doubt takes great pride in being the only one to attempt a work of this kind, and to be able to handle it in such an efficient way. I have read criticisms of the Minutes, but it only emphasizes those critics own shortcomings- they are unable to recognize a new constellation when they see it, or they refuse to look at anything beyond their own back yard. ..."

James P. Conlin, Fort Worth, Texas. " Have been out of the service quite some time. Working up field notes and cataloging fossil invertebrates collected over a period of about ten years has kept me well occupied. I carry a separate catalogue of Recent and Tertiary Mollusca, in labelling and listing this material your ' Minutes' have been invaluable, especially in regard to the many West Coast forms you sent a few years back. I wish there existed enough interested students and amateurs (in Paleontology) to do some such work on zonal collecting and recording the results. Working in the right direction it would be possible to amass a large amount of valuable data on paleontological associations, ranges etc. Your paper stands alone in the field and is certainly deserving of the recognition of specialists and institutions it has obtained.

I am still interested in exchanging Pennsylvanian and Cretaceous invertebrates for either fossil or Recent mollusca. My chief interest lies in Cretaceous Ammonoidae and fossil and Recent Echinoidae. Will also have about 300 or 400 species of Pennsylvanian and Cretaceous Foraminifera for exchange in the near future. "

Bill O'Gara, who visited you while in the Navy writes often. He is doing Macro-paleontology for the Tropical Oil Co. in Bogata, Columbia.

Dr. Calvin Goodrich, Brightwaters, Hendersonville, North Carolina. "... one of the curses of a scientific periodical is its deadwood-- stuff that cannot even be burned and like an unsalable piece of land is a terrible eater of income. You might, indeed , speak of many a publication of the kind as mailing list poor.

I had occasion some years ago to try to recover for library purposes copies of the natural history magazines that had flamed their little hour, and then flickered out. Some never got past the third number. There was one that was launched by the meeting of virtually the entire intelligensia of a community, scientific, philosophical and what-not. Its first issue was its last. I am inclined to think that the swift mortality was due to

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the sight of the printer's bills, a thing that you apparently escape. But, of course, you have a number of other costs and, what must amount to a great deal,the natural weariness with labor given gratis. A Carolina nigger was asked at his trial why he killed a woman for a half-dollar. " Fifty cents here, fiftycents there; it all mounts up " he answered. Well, your little tasks, each of no great importance in itself, mounts up in time. You will forgive me for daring to warn you that some day you will have the problem of the whole to consider. The signs are that you will solve it. But it should not hurt you to know that it is a matter to face.

This is a granite-gneiss-schist region, and nearly snail-less. So I have had to satisfy my collecting instinct on other things, none of them so gratifying as the mollusca. The area is like California in that it is filling up with retired folk. I am not sure that it is a good thing. Perhaps an epidemic especially fatal to the elderly would be of social benefit..."

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Cabrillo Marine Museum

Dr. William L. Lloyd, Director. 38th and Bluff Place,San Pedro, Calif.

The Museum is owned and maintained by the Department of Recreation of Los Angeles for the purpose of interesting people, both childrenand adults, in nature as a leisure time activity, creating nature hobbies.

We have on exhibit over 12,000 shells, not only from California but from our East coast, the South Seas and other parts of the world. Our fossil collection is also quite large.

"The Museum collection also includes many crabs, starfish, fish, marine algae, many of the shore and water birds in habitat groups and many other marine specimens, including one of the largest Leather Back Turtles to be recorded. Its weight was 1,100 pounds.

The Museum has been built up entirely by donations and all duplicates are made good use of in creating nature interests.

The Museum is open daily from 9 A.M. to 5 P.M. including Sundays and Holidays as is free to the public.

The members of the Conchological Club of Southern California and all their friends are especially invited to visit and make use of the Museum and its facilities."

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Minutes of the Long Beach Shell Club- June meeting,1946

In the absence of the president and vice-president, Miss Rogers opened the shell club meeting. Minutes were read and approved, and Mr. James Bailey was introduced as speaker. Illustrated by many beautiful specimens, he talked of his experiences as a shell collector on the Great Barrier Reef, of Australia. He first traded cigarettes for shells in Sydney. Then wearing heavy shoes and gloves and carrying a metal bar, he had his first visit to the reef at low tide, finding forty specimens in 15 minutes. His story of obtaining a gunny sack of cones at one spot, of pearly Nautilus greenand brown cats-eyes, cowries, serpent shells and beautiful corals made us all green with envy. All collectors he met added to his collection. Visits to museums and private collections as the Navy moved from place to placeincreased his supply of knowledge. Some towns visited has no fogs, while at other times he collected shells in a down-pour. Probably one of the high lights of the stay there was a trip by plane the length of the reef. Mr. Bailey has offered to show his shells upon arrangement and is an exhibit well worth while. A written report on his whole time in the area would be of interest to all shells collectors. Miss Rogers reported to the club that one of our members, C. Ray Fowler, was graduating with honors from high school.

Ruth E. Eaton, Secretary.

[illegible]

by Walter J. Eyerdam.

In July,1938 Dr. Goodspeed, director of the botanical garden of the University of California began sending eleven botanists to South America to carry on the work of collecting plants on the second University of California botanical expedition to the Andes. This was the largest plant collecting expedition ever sent to South America. The results of this ambitious enterprise has already proved to have produced a wealth of novelties and of interesting or useful species amongst the seeds, cuttings and herbarium specimens brought back. Botanical knowledge of the southern continent has thus been much increased.

Our expedition was composed of three contingents in South America of which one part collected plants in Peru, the second in Chile and myself and Mr. Allen Beetle of Dartmouth College in Peru,Chile, Bolivia,Gran Chaco, Argentina and Patagonia.

The major portion of the expedition composed of six botanists including myself left San Francisco on July 27 on the Grace Line SS Capac bound for Callao, Peru. On July 29 we stopped at San Pedro,so went to L.A. where I spent several hours at the L.A. Museum visiting with Mr. George Willett and Dr. H.R. Hill and studying the California land shells and minute marine shellls of the West Coast.

Dr. Goodspeed had kindly given me permission to collect such land and freshwater shells as opportunity afforded along our scheduled route. The first set of these was to be for the University of California, the second for the Museum of Comparative Zoology and the third one for my collection.

Dr. Clench has the second series and has agreed to publish a report on those shells in the near future including the description of all new species. The following resume of our route will only briefly mention or describe such localities where land and freshwater shells were collected in order to convey a clearer idea of the localities that will be mentioned in Dr. Clench's report.

Our trip from San Francisco to Callao took 41 days of leisurely steaming along the coast and stopping at many ports in Central America where we utilized every opportunity to go ashore and collect plants.

Having collected land shells in Haiti,Solomon Islands, and other tropical countries where land shells abound in profusion and diversity of varieties it was rather dissapointing to note the leah paucity of land mollusca on the West Coast neat the sea and there were only a few spots where any were found at all along the entire coast. Of course, our brief shore leave in quest of plants did not allow much time for search of land shells, but an experienced shell collector generally has an instinctive sense of feeling as to whether positive or negative results can be expected the moment he passes thru an area.

We collected plants in various parts of Mexico,Guatemala,Salvador,Honduras,Nicaragua,Costa Rica,Panama,Ecuador, and Peru. Mazatlan was our first foreign port of entry. It was during the hottest part of the year but Mr. Beetle and I who were very anxious to become acquainted with the flora went ashore and climbed a small mountain during the hottest part of the day while the rest of the population was taking their siesta. We came back to the ship with 46 species of plants besides about 20 species of shells from the beaches. Several species of sponges, barnacles and gorgonia were collected but no coral was found.

Mazatlan is a noted locality for collecting marine shells but the loss

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common or desirable species are to be found only after a heavy storm. Mazatlan is also noted for the beauty of its senoritas of various shades. This fact is quite apparent to even the most casual observer. Mazatlan has one of the finest and most delightful bathing beaches on the entire west coast of America. A peculiar feature of the waves breaking on the beach is that they curl the opposite from the ordinary beach roller and cause no undertow. The temperature of the water is exactly right and the bottom is firmly packed sand with a gentle slope. There are no sharks or other vicious sea animals.

Some of our men had a bad experience with the little red chiggers which imbed themselves in the skin and are very irritating. One of the botanists had over 200 of them. They are generally in the cow pastures. At Mazatlan no land shells were found.

At Manzanillo, our next port of call, we hired a taxi and went thru this typical Mexican town past several villages and out into the forest beyond. We collected about 40 species of plants, some of them quite rare. Only two species of land shells were found although intensive search was made for them in promising looking spots. Only a specimen each of Bulimulus and Oxystyla were thus found aestivating on trunks of trees a few inches from the ground.

No land or freshwater shells were found at San Jose de Guatemala altho an all day excursion into the jungle back country was made. At La Libertad, Salvador we went ashore and rode by taxi along the fine new highway to San Salvador. Since the suppression of the last revolution about ten years ago this little republic has become the most prosperous of the Central American countries. Coffee exports to Germany have been its chief source of income. Numerous stops were made and a fine collection of plants was made in various habitats, but no land shells. On August 16 at Acajutla,Salvador Mr. Beetle and I collected 25 species of plants including a peculiar parasitic species of the Broomrape family growing on the ground in the jungle in the form of an inverted cone or strombilus. In the near vicinity I found several live specimens of Oxystyla on trees and about a hundred yards from this spot in a saline surrounded by mangrove trees were a species of Corbicula and a Planorbis. About 50 species of marine shells were collected on the beaches. Most of these were small. Planorbis (Tropicorbis) hondurasensis Clessin.

Collections of plants and marine shells were made at various ports but the only land shells found south to Peru were a few specimens of a species of Oxystyla on a small island in the Gulf of Fonseca,Honduras and one specimen of a species of Succinea in a marsh at Punta Arenas, Costa Rica.

At Guayaquil we stopped three days where two excursions into the surrounding woods and marshes were made with Mr. William Clarke MacIntyre who came down from Banos in the Oriente of Ecuador to visit me. Not one land or freshwater shell was found.

In a small stream just north of Supe,Peru is a demersed filiform species of Potamogeton which occurs in dense grassy masses. A dip net revealed numerous shrimps, a small fish and a species of Physa which occured sparingly. This was the only freshwater shell that was found along the coast of S.A. from Panama to the Strait of Magellan. A few species are known to occur within this vast stretch along the coast and they are very sparingly distributed and far between.

On one of the lomas or foorhills of the Andes about 15 miles east of Trujillo amongst slide rock and debris and scant vegetation dead shells of a snail closely related to Bulimulus paytensis were found in abundance. There are probably other races of this species on isolated lomas in this region. The European snail Helix aspersa was a very common pest in the bot-

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[illegible] or slug bait but the gardeners probably never heard of this remedy. No native snails were seen in Lima. A week of energetic plant collecting around Arequipa at elevations of 8000-10000 feet yielded no land shells. Even the heavily vegetated sluggish streams which seemed ideal for the prolific growth of freshwater mollusks yielded not a single specimen. A general lack of lime-stone and the rather recent geological origin of the west coast seems to be dominant factors in the negative occurance of terrestrial mollusca.

Lake Titicaca is about half the size of lake Ontario and lies at an elevation of 12,500 ft. above sea level on the anti-plano of Peru & Bolivia.

Upon arrival at Puno on the N.W. shore I collecected several handfulls os shells from amongst the balsa reeds, a species of Cyperus. Many of them were cast up on the drift line mixed with Myriophyllum, Elodes, and a species of Najas and some freshwater algae. The plants in the shallows are harvested by the thrifty Quechua (pronounced Keeshwaw) Indians who pole their balsa boats about and rake the bottom for the weeds which are fed to their animals. Amongst these plants were found two species of Pisidium, two of Melania, two of Planorbis - Pisidium titicacense Pilsbry, Musculium sp., Talphia montana d'Orbigny, Planorbis andecolus d'Orbigny, Littoridina andecolus d'Orbigny, Littoridina (Heliobia) berryi Pilsbry, and other species. Although these are nearly all endemic to the lake and there are undoubtedly a few more species in the deeper water there seem to be no endemic genera. There is no such diversity of species and genera as exists in the large old world lakes Baikal and Tanganyika. Lake Baikal which is over 6,000 ft. deep I have visited twice and I have found 30 species alone of the endemic genus Baikalia from as deep as 1200 feet.

We travelled thru Bolivia and down into the Gran Chaco of N. Argentina where three months were spent in collecting plants. The large snail Borus oblongus was very common in some areas of the region and seems to have a wide distribution in South America. It is found chiefly in the forests and starts to crawl about after a heavy rain. About a dozen species of land shells were found in the provinces of Jujuy and Salta- Epiphragmophora trig-rammophora, Bulimulus 6 sp., Borus oblongus.

On September 26,1938 a species of Planorbis - Tropicorbis peregrinus d'Orbigny, was collected in Yala lake on Yala mountain about 30 miles from Jujuy at about 6,000 ft. elevation. These were living amongst Elodes and Callitriche.

Most of the rivers in northern Srgentina which are nearly dry or compl-etely dry in the dry season have no freshwater shells.

A small species of Ampullaria was found in abundance in a sedge swamp about 5 miles west of the Rio Azara and another species of Ampullaria was collected in a dry stream bed two miles north of the Bermejo river at Embar-cacion. In 12 days of travel along the banks of the Tariga and Bermejo rivers on the Argentine Chaco and Bolivian border no land or freshwater shells could be found. We went thru the Gran Chaco and down the rivers Pilcomayo Paraguay-Parana-La Plata to Buenos Aires where we stopped three weeks before starting on an excursion to southern Patagonia. In B.A. I visited Dr. Doello Jurada, director of the national museum. He and Dr. Carcellos showed me the fine large collection of Argentine shells in the museum, and a large lot of correspondence and papers as wellas shells that I had sent in former years. The freshwater snails Chilina and the land snail Odontostoma seem to be represented by a host of species in the southern part of South America. Closely allied genera live in the southern part of South Africa and are also numerous in species.

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A few species of land and freshwater shells of the genera Helix, Ampullaria, and Unio were collected froma slough of the Rio de la Plata about 20 miles from Buenos Aires. At the La Plata museum I classified about 500 species of shells in three hours. Most of them were exotic marine shells.

An excursion after plants with a party of botanists to the mouth of the Parana river where itenters the Rio de la Plata and forms the largest delta system of any river in the world revealed not a single molluscan species. This is rather remarkable because the Parana really does have quite a number of species of Unionidae and Ampullaria which probably seek the deeper holes in the river.

In Buenos Aires I found a large colony of the European snail Helix lactea on a street corner. Most of them had recently died perhaps of starvation as I presume they were lost by some Latin epicure some days previous. The Italians are rather fond of these snails for food.

On December 9th Mr. A. Beetle, Sr. Eduardo Grondona and I started south from the city of La Plata in our brand new Ford truck on a 10,000 mile excursion into Patagonia to collect plants and especially to look for rare species of tobacco plants.

A number of marine species of shells were collected near the mouth of the Rio de la Plata near the city of Mar del Plata. At this locality right in the ocean beach bedrock at half tide mark I found the shell of a huge giant Armadillo, a species of Glyptodont. The armor plates were about one inch in thickness. This was very near the type locality of several species of these Antediluvian living tanks. One of the largest collections in the world of Glyptodonts and other large creatures of the remote past are on display at the great La Plata museum which seems to specialize in fossils of large vertebrates. No land or freshwater shells were found until we reached the Rio Quequen about 20 miles N.W. of Necochea, province of Buenos Aires. At this place the river flows over a small travertine limestone falls about ten feet high and also forms a succession of pools with precipitated lime slides and bottoms caused from heavy deposits of Chara. These pools and river shallows are also overgrown with masses of Potamogeton and freshwater algae, and living Chara. This association of aquatic plants supports a large population of snails, mostly Chilina- Chilina strebelia Pilsbry, Chilina parchappi Pilsbry, Littoridina australis d'Orbigny, Tropicorbis peregrinus d'Orbigny. and a tiny white elongated species closely related to Paludestrina. The dead shells of this tiny snail together with the lime residue from the Chara forms subfossil beds of marl up to several feet in thickness along the river banks. In one of the travertine pools there was a dense mass of mature duckwood or Lemna. In running water at one side of the river a species of yellow Mallow was common in deep mud.

On Dec. 15,1938 I collected five species of land shells on a rocky ridge on the hacienda Ducous in the Curumalan mountains about 15 kilometers N.W. of Pigue, department of Saavedra, province Buenos Aires. There were Bulimulus and Odonstomus and were crawling around on the rocks exposed to the full glare of the sun.

On Dec. 20th a colony of Bulimulus was found under a prostrate species of Opuntia on a rocky slope in the isolated Sierra Grande mountains, a range of granodiorite. This was about 20 miles west of the Golfo San Matias in Patagonia. The following is taken from my diary of Dec. 21ml938.

Today drove all around the Valdez peninsula about 200 miles. This land is connected by a narrow isthmus and separates the Golfo San Matias from the Golfo San Jorge on the coast of Patagonia. We had anticipated a good flora and especially a radically changed flora and fauna but were quite dissa-

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-pointed in the negative results. We found only a few plants that we did not already haveand these were hard to find. The whole peninsula is covered with the same monotonous flora of shrubs that we have passed thru in a thousand miles of latitude but of a more stunted habit. It is easy to see how a taxonomist would describe plants from this district as new subspecies of plants growing farther northon the mainland but these are exactly the same that are subject to a more xerophytic existence and are for that reason more stunted. There are no cacti on the peninsula and practically all shrubs are decidedly thorny/ During brief periods of rain a considerable area is covered with grass and annual plants sufficient to sustain a large number of sheep. Much of the terrain is covered with Tertiary Ostrea beds (large thick oyster shells). Several smaller deposits of strata have Cardium, Pecten and a few gastropods. A species of Bulimulus was found under bushes on the north coast of the peninsula. At the source spring of the Grand Saline which is a salt lakeformed from the evaporation of ground waters, a species of Paludestrina was found in abundance living in little pools of slime mud amongst Ranunculus and two species of sedges. Some interesting gastropod fossils were taken from strata in a sandy arroyo. We ate dinner at the hostel at Puerto Pyramides, a small village situated near the sea amongst sand dunes at the mouth of the dry arroyo. We were told that last year 20,000 seals had been slaughtered for their hides on the peninsula. We drove about 80 Km. over very rough roads to try to get to the loberia or seal rookery but had to turn back because of the late hour. It rained lightly for about two hours. The dry season is nearly ended and the drought has been unusually long. Thousands of sheep have been slaughtered or moved to the mainland because of the droughtso a good rain will soon be a godsend tothe sheepmen and the animals of the district. The whole peninsula which covers about 4 million acres is owned by a Spanish Basque who grazes many thousands of sheep.

We saw several ostriches andan armadillo and plenty of day owls and hawks. The common jack rabbit introduced by some short sighted fool is everywhere and thatdevastating pest is the scourge of Patagonia. No more can the traveller in that region see flocks of the agouti or Patagonian hare such as Darwin saw a hundred years ago in vast numbers up to ten thousand at one time. This tall and very interesting rodent which was really an asset to the country in which it lived is now rapidly approaching extinction on account of its food being destroyed by jackrabbits and overgrazing sheep.

The peculiar martinet birds which live in holes in the ground seem to be of a different subspecies than the birds of the mainland, being much shorter and wider. The owls hunt small rodents in the daytime and are generally to be found in threes and fives sitting on fences or standing in the middle of the road. The evil looking carancha bird which is a sort of an eagle vulture seems to hold its own everywhere that sheep and cattle are raised in Argentina and some of themare nearly always at hand where there is a flock of sheep ready to tear out the eyes of any sheep that falls down from exhaustion. This bird is, of course an excellent scavenger and is only really destructive to very young stray lambs. The sheep menare not so fond of shooting all kinds of birds as some of their North American co-workers are, but the martinet birds which are generally a cock and two hens run swiftly along the road to their holes and are really a fine game bird to hunt. Besides a shotgun it is necessary to carry a shovel to hunt this bird successfully. This reminds me of hunting the wily and delectable goeduck on the mud beaches of Puget Sound with a clamgun which is merely a long handled shovel.

No other land shells were found in Patagonia altho we travelled, almost the whole periphery of that vast bleak and barren territory of high winds and dust storms, explored much of the western and interior parts and crossed

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the country five times. Freshwater shells were also conspicuous by their absence. in most of the rivers and lakes where they were expected to be present. About 100 Km. north of San Julien in a dry marsh which becomes wet whenever it rains about a dozen species of small but interesting and rare plants were collected. About 100 specimens of *Succinea burmeisteri* Doering were found in the hard mud. At San Julien we visited Herr Erwin Habicht, a Swiss whose father-in-law owns one of the largest estancias in Patagonia, which must be of considerable area in a country where a ranch is not considered of much extent unless it is at least a million acres. I had a letter of introduction from his brother Paul who lives in Seattle. Me Habicht took us in his car to several uninhabited places of great historical interest becaise of their remoteness from the beaten path of travel are seldom seen and known to but a few people even in Argentina. One spot that we visited about 20 miles south of San Julien is the site of what is said to be the first settlements ever attempted by the Spaniards in South America which was shortly after the return of the first circumnavigators of the globe to Spain, or was it Portugal. It must have been an extremely lonely place for these settlers who were put sshore to found a colony on the bleak and forbidding shore of a vast empty and barren desert where only the poorest crops of grain or vegetables could be raised even with much labor. A clear limpid brook runs thru the site of the settlement which apparently was the only life sustaining feature that the people had. Numerous broken terra cotta tiles prove that an attempt at irrigation had been made. At that time there must have been large hers of guanacos, ostriches and agouti, so failing in the supply of game animals by wandering too far back into the desert the colony was soon doomed to perish from starvation or massacre from the roving bands of Indians who at that time were said to have been canibals and had not up to that time ever seen a horse. Horses escaped from this small settlement are supposed to have been the ancestors of the wild horses of Patagonia which the Tehuelche Indians were so a adept at taming.

Two other historic spots but not known to many people can be seen in the bay of San Julien. The most valuable historic record is the petrified keel of Mendoza's ship that mutinied against Magellan because the disheartened crew feared to follow the cold stormy coast ever farther south into colder and more inhospitable unknown seas from which there was but little hope of ever returning to Europe. There seem to be no shipworms or *Teredo* along this coast and I could find no piece of driftwood along the whole Patagonian coast with signs of the ravages of this wood-b ring mollusk. The ship of Mendoza was sunk by a broadside from Magellan's ship early in the morning just as it was about to slip the anchor and steal away in the fog. Several of the ringleaders of the mutineers were hanged on a nearby hill and Mendoza was put in irons. As a very remarkable coincidence practically the same thing happened at the same place and apparently for the same reason during the second circumnavigation of the globe under Drake's flag. As near as can be conjectured Drake's mutineers were hanged on the same hill as were those of Ferdinand Magellan. The traitors were all hanged on hangman's hill.

A large collection of plants was made along the whole route of our travel and but few species in flower were missed. In a small lake about 30 miles north of the Strait of Magellan on the Rio Gallegos-Punta Arenas road *Lymnaea diaphana* King was found in abundance, but no other species. Punta Arenas or Magellanes on the strait is a city of about 40,000. Besides being the cross-road of Atlantic and Pacific shipping it is the most important outlet for the Patagonian and Tierra del Fuegan wool and center of an important gold mining district and of several local industried. Most of the surrounding country has

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been logged off of its small forests of Antarctic beech and is covered with grass and hardy weeds which furnish good fodder for the sheep. The island of Tierra del Fuego which is about the size of the state of Ohio and is owned by both Chile and Argentina is a land of mountains and glaciers and abundant precipitation which sustains pasturage for some of the largest herds of sheep in the world. Most of the Indians up to very recent times were mercilessly hunted down by professional white hunters who received one British pound for every Indian nose from the big sheep ranch owners to rid their stolen lands of the rightful owndrs. This practice went on until two tribes were completely wiped out of existence and the remnants of the remaining Indians were rescued by Catholic missionaries.

About 50 Km. S.E. of Puerto Natales, Chile along the bank of the Rio Ruben a species of Lymnaea was taken from the deep oozy mud amongst *Batrachium* and *Callitroche*. Not far from this site on the road to Punta Arenas is a peculiar *Sphagum* bog where the moss grows into mounds like haycocks or beaver huts all over the bog. They are about one to one and one half meters high. The inside core is of gumbo mud and it is possible that these mounds have persisted for hundreds of yearsand have increased instead of deteriorated in size. Near Tenino,Thurston Co., Washington are thousands of mounds of similar shape as those near the Rio Ruben that have persisted since the ice period and this region marked the southern limit for the ice cap in the state of Washington. Many theories have been advanced by geologists and students, some of them being rather fantastic. I have passed these mounds many times and could never understand how they could have been caused until viewing those peculiar mounds in Patagonia which are still in the process of building. I believe that the Tenino mounds were formed in a similar manner.

All of the large lakes of Patagonia were visited and their shores explored for plantsand shells. These include the lagos Argentina,viedma,San Martin,Tar,Musters,Cohuel,Huapi,Buenos Aires and lago Nahuel Huapi. Lago Argentina which is about 100 miles long and which lies in southwestern Patagonia is one of the largest lakes visited. On its western end it lies in the region of the glaciers of the Chilean inesplorado. It was the only lake that yielded shells. In the national museum at Buenos Aires I saw some *Lymnaea* and *Planorbis* from Lago Nahuel Huapi, but I found none at Barilcoche. Herr Brodersen who runs a hostel and a ranch near the shore of lago Viedma said that he had seen a few snail shells cast up on the beach of the south shore after heavy storms, but I found none on the north shore which is mostly heavy glacial gravel from the glacier on the western end of the lake. In a lagoon on the north shore of this 75 mile long lake grew dense masses of a species of *Myriophyllum* which attains a length of over 3 meters. Windrows of this plant lined the shore to a depth of a foot. Careful examination of this promising looking material yielded no shells. The lagos of S.W. Patagonia including Argentina,Viedma,San Martin and Buenos Airesall have glaciers on their western ends which lie within Chilean territory. The lago Tar seems to be a lifeless body of water in a barren volcanicdesert in the region between lagos Viedma and San Martin. The lagos Musters and Cohuel Huapi are of considerable extent and lie close together in the N. central part of Patagonia. They are shallow bodies of water subject to much variation of shoreline throughout the year. Neither of these lakes are inhabited by mollusks. Nahuel Huapi is a large lake in N.W. Patagonia which extends into Srgentina proper and into the Chilean Switzerland. Its general shape with its deep fjords winding amongst steep high mountain valleys is like a great octopus. It is the favorite resort of the well-to-do tourist or vacationist of the Argentine.

(To be continued in the next issue).

~~Woodring~~

The following index covers the Minutes of the Conchological Club of Southern California numbers 1 to 63 inclusive in which the Pelecypoda, Scaphopoda, and Gastropoda are discussed. A separate index will be prepared for later numbers dealing with the Amphineura and other groups.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
October 1946

These papers are published by a group of interested students for our own pleasure. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, any person or institution will receive all papers published by our club by contributing $2.50 per year or more to our fund. Expenses are defrayed by voluntary contributions of members and friends.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news about shells to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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Dr. and Mrs. Thomas A. Burch and children were with us here for a day and a night en route to Guatemala where Dr. Burch who is with the U.S. Dept. of Public Health will be engaged in research for the next several months. They travelled by plane from Washington, D.C. and will continue their journey by air.

****

Mrs. Ora Willett is trying to get a complete file of Mr. George Willett's writings. Anyone having any of the following numbers of the Nautilus in duplicate please advise the editor and we will either buy or exchange for them. Mrs. Willett wishes twocopies each of the following:
Nautilus 42-No.2; 43-Nos. 1 & 4; 44- Nos. 1 & 4; 45- Nos. 2,3,& 4; 47-No.3; 49- Nos. 1 & 2; 50- Nos. 3 & 4: 51- No. 1; 52- Nos. 1,2, & 4; 31- No. 4.

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Some New Publications Received-

" Zoological Nomenclature and Some of its Difficulties" by Dr. Joshua L. Baily Jr. Herpetologica,1946, vol.3, pp. 41-48.

A review of " The Molluscan Family Planorbidae" by Frank Collins Baker by Dr. Joshua L. Baily Jr. Ecology, Vol.27, no.1; January,1946,pp.96 and 97.

Report of the United States National Museum for 1945- 112 pp.

The mimeographed proceedings of the Auckland Museum Conchology Club for April,1946. Our New Zealand cousins are getting our a very interesting paper that should find a place in every conchological library.

The Journal of Conchology, vol.22, no.8, May,1946. Reference to the paper in this issue by Dr. S.S. Berry will be found on page 3. There are a number of other fine papers not relating directly to our westcoast fauna. Winckworth has two papers of note " The Dávila Catalogue" and " Turton's Edition of Linne's System."

Mr. Fred Tobleman, 13½ Brenner St., Newark, N.J. We are very sorry to hear that Mr. Tobleman has been in the hospital for the past four months having undergone a serious leg operation. However, after some 14 months of illness he is improving and is looking forward to his return home and to the study of his shells.

Commonwealth of the Philippines, Dept. of Agriculture, Office of he Secretary, Manila. " This is to acknowledge with many thanks the receipt of a copy of Illustrated Glossary, Part I, Pelecypoda for the rehabilitation of our Scientific Library. This publication is most timely in view of our work in rebuilding our conchological collection which was destroyed by the enemy during the war. We hope that our library has been placed on your mailing list to receive the subsequent parts and any other publications you may issue from time to time."

Mrs. Lillias F. Cockerill, Sanibel, Florida. " .... We had a few rather amusing incidents as an aftermath of the '44 hurricane when a number of cottages some of them containing good shell collections were destroyed. Naturally a few specimens from such have been found on the beaches and some tourists are quite indignant when you tell them that the shell they have found does not belong here. " But I found it" they declare. It may belong to Fiji or the Philippines or it may be a pearled central Pacific specimen but if they found it it " must be native.". One lady who found a Mitra episcopalis was quite positive that it was a " red" junonia."

Dr. J. Harlan Johnson, Colorado School of Mines, Golden, Colorado. " During the past year we have been snowed under with students, so that relatively little time has been had for research. We have completed several papers describing fossil algae and an interesting association of algae and foraminifera, but have not done anything with mollusks beyong working up a large collection of Pliocene material from Florida.

We are definitely interested in your activitied. We are keeping your publications on file in the laboratory where they have created considerable interest among the students."

Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa. " ...I went collecting today and returned with a sackful of Haliotis and Turbos. Turbos chiefly. The weather was against us and it was freezingly cold. We were unable to get to the outer reefs where the big Haliotis are. On the sands we struck the tracks of a pair of leopards and their cubs, these animals are quite plentiful as there is a good deal of game including baboons for them to feed on."

Rev. C.E. Fox, Siota, Solomon Islands. " On returning home after 5 months in New Zealand (my first holiday for 6 yrs.) I found your Conchological Club paper waiting me (for Sept., 1945). Thank you for it. In New Zealand at the Museum in Auckland Mr. Powell was able to identify the genera of most of my shells (I took some with me), but in a good many cases apparently they were either new species or not easy to identify." " Most of the Cypraea aurantia i see in museyms (e.g. Auckland), come from Fiji, butthe Solomon Island ones are a much richer orange than the Fijian. When I placed a Solomon Island C. aurantia alongside the Auckland Museum Fijian one Mr. Powell agreed they differ in colour. "

Miss H.F. Fox, Bethlehem, Tauranga, New Zealand, sister of Rev. Fox has two fine specimens of the Solomon Island Cypraea aurantia that she will s sell.

Dr. Irene McCulloch, Hancock Bldg., University of Southern California, Los Angeles 7, Calif. has a complete file of the Nautilus with the exception of vols. 1-12 inc. Anyone able to supply these please write her.

Dr. S. Stillman Berry described a new species of Neosimnia in the Journal of Conchology, vol.22, no. 8, May,1946, pp. 190-193. His remarks on this group are rather extensive and interesting. The original description of the new species follows:

" Neosimnia bella-maris new species- " Shell fusiform, thin, translucent robust, strongly swollen at about two fifths of the way from the apex, the maximum diameter about 45 to 50 per cent of the altitude. Surface polished and glossy; growth lines numerous, very sharp, fine and inconspicuous, crossed by weak microscopic traces of fine spiral striation; otherwise without sculpture except for perhaps seven to nine low , obscure, rather wide spiral cords at the apical extremity and six to eight similar ones descending spirally from the columellar region anteriorly. Shell rather abruptly pointed at both ends, but a little more produced at the apex than basally. Outer lip strongly arcuate, thickened, whitish, medially produced,retracted at both termini; apically abruptly narrowed, emarginate, and notvhed; anteriorly retreating into the short , weakly reflexed canal, which is slightly exceeded by the tip of the columella. Columella twisted and pinched , its anterior extensionarcuate and somewhat bent inward; columella callus smoothing evenly over the whorl without a definite outer boundary; fossula very steep, moderately excavated and with a low, nearly immersed , inner swelling or hump.

Colour of body of shell brownish vinaceous with some clouding of deep brownish vinaceous, or dimly banded with two narrow paler bands and three wider ones of the deeper hue, paling abruptly to light buff or light ochraceous salmon in the zone back of the aperture, also paling to light buff terminally where it is barely tipped with mustard yellow.

Measurements- Alt. 24.6, Maximum Diam. 10.8, Diam of aperture at widest point 4.3 mm. Holotype- Stanford University, Paleo. Type Coll. No. 7846.

Type locality: 18 fathoms off entrance to San Diego Bay, Calif.; C.W. Gripp, from dredg8ngs summer,1908; three known specimens.

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Lyonsia californica haroldi Dall- We recently published an extension of range of this large bay form to Tomales Bay, Calif. John Q. Burchand Mrs. Burch recently collected it from Humboldt Bay near the town of Samoa which isa point much farther to the north.

****

Cryptochiton stelleri Middendorff- The editor and Mrs. Burch collected for five days around Crescent City, Calif. the last week in July and found this species very abundant. We experimented with several methods of preparing the specimens and will be interested in any suggestions from other members. The size of these huge animals makes it impractical to attempt to handle them as other chitons are handled. We are disposed to think that our best specimens were prepared as follows: first tie the animal tightly to one of the large redwood shingles which seem to be available on all sides. If any difficulty is found in getting the specimen straightened out we would place it on its back in a tray of sea water. We found that perhaps the most satisfactory ties were strips of burlap sack cut in straps about two inches wide. Shorter or narrower ties seemed to mar the specimens because of the power needed to hold it down tightly to the shingle. Then while we have been advised never to use formalin on chitons we nevertheless found this the best method. We simply killed them by dropping them into a large can of fairly strong formalin solution. We then removed the entrals and after stuffing them with soft paper again strapped them tightly to the shingles. The formalin seems

(con.)

to preserve them and the specimens so treated dried out rapidly without odor or difficulty. We tried alcohol and found it not so successful. And those simply placed out to dry were usually hastilly buried on about the fourth day. Mr. Allyn G. Smith has a beautiful specimen said to have been prepared by a Chinaman since deceased. Just what this Chinaman used seems to be a secret that dies with him. It appears to have been treated with some kind of oil but the final result is remarkably fine.

Large specimens of Katharina tunicata are also something of a problem. However, there is not so much flesh to them as to involve the same trouble we have with the Cryptochiton, but it requires considerable skill to get a perfectly prepared specimen. Our principal trouble with these was that when drying they have a tendency to draw. Large Mopalia or Ischnochiton do not seem to have this tendency.

We found the chiton collecting excellent at Crescent City and filled every glass slife we had in the first few days. We had a few of the plastic slides used by Mr. A.G. Smith. These slides are made of strong thin plastic with a piece of heavy carpet tape tied to one end in a slot with another slot at the other end to hold it when the chitons are tied. These slides are really the thing because they will not break as the glass will.

****

Tellina bodegensis Hinds,1844- While collecting at Crescent City we had occasion to note some of the habits of this species. The editor and Mrs. Burch were collecting Olivella biplicata Sowerby which was almost unbelievably common on all of the sandy beaches both north and south of Crescent City, when just before the incoming tide Mrs. Burch noted the Tellinas. They seemed to cut a circle or semicircle appearing much as if a person had taken a collecting knife and cut the sand in that fashion. At the end of each such cut was a nice live specimen. In a comparatively short time we took over 200 specimens of Tellina bodegensis a species which we have found to be by no means common.

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Littorina planaxis Philippi,1847 and Littorina scutulata Gould,1849. While Crescent City is far from an extension of range for either of these species, our experience has been to find them in more or less separate places. The breakwater at Crescent City is interesting in that both species are found in large numbers and intermingled. We could find no evidence of anything resembling an intergrade though.

****

Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. " In the April number of the Nautilus Sylvia Jacobs gives a description of Pediculariella californica(Newcomb). She says " This is the first known occurance of these shells south of Monterey." In March of 1936 John Nonella, a Monterey commercial hook and line fisherman whose regular fishing station was outside of Point Lopez about 55 miles by road south of Monterey brought me a small piece of Allopora californica Verrill, a very dark red hydrocoral. He said he took it in about 70 feet of water. Nearly imbedded on this coral were two fine specimens of dark red Pediculariella. I still have them in my collection. In the summer of 1939 I was out several times with Thomas Riviera a very skillful commercial abalone diver. On one of these trips he brought up a large bunch of hydrocoral from the side of " Lyon Rock" located outside of Pt. Buchon, San Luis Obispo County. Unlike my previous piece it was much lighter colored varying from light pink to a pale purple.

As I mentioned to you before I have also taken Haliotis wallalensis Stearns as far south as Pt. Buchon in from 10 to 15 fathoms...."

Dr. A. Myra Keen (Per. Comm. Aug.,1946) gives the following interesting data:

" Here is a complete list of Martyn's specific names that apply to West American species, with indication of the first available alternative and its modern allocation:

Trochus annulatus Martyn = T. annulatus Humphrey,1786 = Calliostoma (Zizyphinus) annulatum (Humphrey)
T. canaliculatus = T. doliarius Holten,1803 = C. (Z) doliarium (Holten).
T. costatus = T. ligatus Gould,1849 = C. (Z.) ligatum (Gould).
T. inaequalis = T. gibberosus Dillwyn,1817 = Astraea gibberosa (Dillwyn)
T. pulligo = T. pulligo Gmelin,1790 = Tegula (Promartynia) pulligo (Gmelin)

Buccinum liratum = Murex lyratus Gmelin,1790 = Neptunea lyrata (Gmelin)
B. lima = Murex lima Gmelin,1790 = Purpura (Nucella) lima (Gmelin).
B. plicatum = B. lamellosum Gmelin,1790 = P. (N.) lamellosa (Gmelin).
B. saturum = Fusus saturus Deshayes in Lamarck,1843 = Neptunea satura (Desh.)

Purpura foliata = Murex foliatus Gmelin,1790 = Pterorytis foliata (Gmelin).

(Cochlea) corbis = Cardium nuttallii Conrad,1837 = Clinocardium nuttallii (Conrad).

As far as species are concerned, this closes the book on Martyn. There still is the problem whether his generic names are available. The International Commission is considering some analogous cases which should decide the matter within the next few months or years. From recent decisions it seems likely that the names will be rejected. Winckworth (Proc. Mal. Soc. vol. 18, pt.5,1929, p. 229) has discussed the generic names. Of Mitra he says that it dates from Roeding,1798, which, as he has shown recently, has as type M. episcopalis Roeding = Voluta mitra episcopalis Linné,1758. Oliva, he says remains Oliva Cuvier,1798, which has several months priority over Porphyria Roeding,1798. I note that in the 1945 paper on Boltenian genera he, Winckworth, dates Oliva from Cuvier,1797. The type by monotypy is Voluta porphyria L.

I do not recall anything else in the Check List that needs rectification except the species name on Litiopa. It is Litiopa melanostoma Rang, not L. bombyx Rang, as Mrs. K. Palmer points out in Nautilus (vol. 58, p.70, 1944). Incidentally, there is available a name for the West Coast species if anyone ever gets enough specimens to determine whether it is separable from the Atlantic form which Rang described. Tryon, whose lumping is notorious, considered the one species to be present in all the warmer seas. However, in 1856 Carpenter described Litiopa divisa (Proc. Zool. Soc. London for 1855, p. 234) as follows:

L. t. parva, anfractibus ix, quarum vi, primi subturriti, liris transversis striisque spiralibus decussati, ultimique tres sublaeves suht, tumidores, striulis plus minusve appressis, spiralibus, maxime ad basin, tenuissime ornata; nonnunquam linea suturam impressam subeunte; subdiaphana fusca; labro acuto; labio vix monstrante; columella truncat-, infra maxime undata." Long. .13, lat. .06, long. spir. .07, poll.; div. 30 dregees. Hab. Cape San Francisco: legit clar. Hinds. Mus. Cuming.

" This is the only species hitherto recorded from the west coast of N. America... It is remarkable for the different character of the first six and he last thr the decussated portion suddenly becoming smooth, the joining whorl being often irregular in growth."

As the Stanford collection contains only a single West Coast specimen, which I collected at Punta Penasco, a single Atlantic specimen from Puerto Rico, and about a dozen from New Guinea, I am not able to pass judgement on Carpenter's distinctions.

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Land and Freshwater Shells Collected in South America in the Years 1938-39

by Walter J. Eyerdam

Con. from Min. #63,p. 24.)

The region around Califate near the south shore of the lago Argentina is not especially rich in plants but the scenery is fine. Back of the village of Califante are big stratified metomorphic cliffs and across the lake are wild snow covered mountains most of which are still unexplored. The plateau is only about 300 meters in elevation but it gets very cold in winter and the icy winds blow almost constantly. About 20 years ago lago Argentina attained a considerable amount of notoriety in some of our nature faking news papers on account of a British expedition which was said to have outfitted at great expense to try to catch live prehistoric animals including the Plesiosaurus and other fantastic monsters of remote geological ages past which were said to be still living in this lake. It is very doubtful whether any member of this expedition had any thought of the existence of such animals. The fact is, however, that a great many species of fossil animals have been found in the Patagonia and it is certainly a productive field for the well equipped paleontologist.

Chilina smithi Pilsbry, Chilina fulgurata Pilsbry, Lymnaea diaphana King, Lymnaea viator, Musculium patagonicum Pilsbry, and Pisidium magellanicum Dall were found in abundance cast up on the sand shore of lago Argentina in windrows mixed with Myriophyllum and Anacharis on the south shore of the lake. Large flocks of the Patagonian kelp goose were always at hand on the muddy flats of the back beach area of this part of the lake shore. Farther down the coast toward the east where the shore was strewn with boulders only a few specimens of depauperate Chilina and Lymnaea were found. About ten miles east of Califante near the lake are cliffs of andesite and conglomerate..Some of the best examples of wild erosion that I have seen occur on those cliffs, and in a cave we saw a few Tehuelche Indian inscriptions. My colleague, Mr. Beetle took some photos of these picture writings and of the wild erosion formations.

On Jan. 19th,1939 we drove all day long until evening over rough and very bad roads thru uninhabited country and arrived at Caracoles which consists of a small hostel and a general store. The whole land between lago Viedma and this place is the same monotonous waste of arid region which characterizes typical Patagonia. In two stagnant pools of the Deseado river about 12 km. N.W. of Caracoles I found a few specimens of a species of Pisidium and a large species of Chilina. These slimy pools were 3 yards to five yards across and full of the smelling Chara of two species and a stand of bullrushes in the larger pool. In the small trickle that was still left of the Deseado river at this season were Potomogeton,Carex,Rannunculus, and Myriophyllum.

Friday, Jan. 20,1939 town of Lago Buenos Aires. Today we saw a flock of 60 guanacos. We collected Nicotiana corymbosa, always a weed in sandy spots near villages or estancias. We have not found it elsewhere. Very bad roads were traversed for hundreds of miles as usual and thru stretches of gumbo clay deserts where there was no sign of plant life. Small ranges of hard [illegible] clay of many colors, some were hills of yellow ochre and Sienna, of kinds suitable to the manufacture of cheap paint. Some of the hills were of bright red ochre, some of burnt umber and of many varieties of colors. Stretches of new roads under construction are in progress in many remote and hitherto untraversed areas of Patagonia and it is expected that within the next ten years practically the whole territory will be accessible to auto traffic. At the rate that our South American neighbors are making new roads it is expected that within the next ten years it will be possible to travel by auto from the Arctic Ocean to the south end of Tierra del Fuego or for that matter from Tierra del Fuego to Paris or any part of Europe via the Bering Strait if international complications are favorable.

Although diligent search was made at every pond and small lake for shells, only a single specimen each of a *Planorbis* and *Ancylis* were found in a pond near the town of Lago Buenos Aires.

Many days were spent in collecting plants along a thousand miles of the shores of the Rio Chubut which is mostly in uninhabited region. Only at one spot called Paso de Martiros on the Chubut did I find shells. These were a *Planorbis* and *Chilina fluctuosa* Gray.

The object of the excursion into Patagonia in which we travelled about 18,000 miles was the quest for three rare species of tobacco (Nicotiana). The rarest and most desirable species was a tiny plant about one inch high which was known only from a single sheet collected in 1898 by Spegazzini who described it as Nicotiana acaulis. It was found at that time in the district of Monte Leon in S.E. Patagonia. We could not find it down there but finally we found a small patch of it growing with very long roots on a few gumbo domes in a river wash. The locality was nearly two thousand miles N.W. of the only other spot that it had ever been reported from.

At Bariloche on the shore of Lago Nahuel Huapi I sold out Ford truck. Our Argentine companion botanist Eduardo Grondona went back to Buenos Aires while my other companion Mr. Alan Beetle and I travelled thru the Chilean Switzerland and on to Valparaiso. After a couple of weeks in Valpo Mr. Beetle returned to California while I went up the coast and over into Bolivia again where I collected plants in the districts of Cochabamba and the Yungas for about three months. Land and freshwater shells were surprisingly scarce even in the most likely looking places. Several species of *Bulimulus* and one giant snail which is found more or less sparingly along *the eastern* slope of the Andes in the tropical forests. It is *Borus popelareanus*.

While travelling thru the Chilean Switzerland *and walking along the* pumice pebble shore of Lago Llanqueque I found over 100 dead specimens of *Chilina ihringi* Marshall and one valve of a *Unio*.

In the desert back of Mollendo, Peru, a species of *Bulimulus* was not uncommon.

On the 3rd of May, 1939 while on the return voyage on the Condor I visited Dr. Don Frizzell and his wife Harriett whom I knew when they were students in the University of Washington in Seattle. Later in the year they were both back in Seattle and paid me a visit. Dr. Frizzell is the paleontologist for the Standard Oil Co. at Negritos, Peru and has quite a large collection of shells and fossils at that place in his laboratory. When we were stopping here 8 months before the entire region was a barren desert of shifting sands and sandy arroyos where it seemed that nothing except a few xerophytic plants could hope to survive but on our return trip the region had been visited by a deluge of rain, the first in 25 yrs. and now the grass was deep over the entire landscape. In conclusion I must say that western and southern [illegible] is poorly represented by land and freshwater shells.

A. Sorensen,247 Granite St., Pacific Grove, Calif. We have a card from Andy who is attending the meeting of the American Malacological Union.

Dr. Hans Friedrich,Muenchen 8 (13b), Schneckenburgerstr, 15 I, Bayern, Germany. We were very happy to again hear from Dr. Friedrich enclosing a fine list offered in exchange as wellas a list of desiderata. He has survived the warand is again trying to reestablish his shell collection. The letter was written in German to Dr. Thomas A. Burch who promised to translate it and give us more details.

Mrs. Ida Worthy,R.D. Patumahoe, New Zealand and
Miss M. Holloway,32 Pentland Ave.,Mt. Eden S 2, Auckland, New Zealand

We were pleased to receive nice letters from both of the above as well as nice boxes of shells. It is odd to read of the cold winter evenings of which they write when it is our hottest season of summer.

Dr. Raul P. Guitart, Kate Plumer Bryan Memorial School,Guines, Cuba. " I am preparing a paper on " The Edible Mollusks of America ". I am soliciting information from every available source throughout the continents. I will certainly appreciate a list of the edible mollusks of California and any paper dealing with edible mollusks will be gladly welcomed. I will also appreciate very much the remittance of specimens of these mollusks."

Dr. L.A.W.C. Venmans, Bladel (N.-BO, Netherlands. Please note Dr. Venmans new address. He writes that many of our members have sent him boxes of shells for exchange with some embarassment because of the fact that his stock of duplicates has been temporarily exhausted. During the war it was impossible to collect along their beaches as we well know as we had the same experience. Therefore there may be some delay . Dr. Venmans has been devoting his interests in recent years largely to the landand freshwater species.

Minutes of the Conchological Club of Southern California

The Conchological Club of Southern California met tuesday Aug. 6th at 7:30 P.M. at the Los Angeles Museum in Exposition Park. The meeting was called to order by Dr. W.O. Gregg, President with 17 members present. We were happy to have several old members with us who haven't been with us for some time. It was good to see you. Come again. There were no reports from committees. Several members were on short collecting trips since the last meeting- they were Dr. Gregg who was at Lake Arrowhead and founda rare Helminthoglypta and other interesting material. In our own back yard Mr. Geo. Kanakoff did some land shell collecting. We miss the Burches, Chaces, and our loveable secretary Mrs. Effie Clark who are away on collecting trips or vacation.

The meeting was then turned over to the speaker of the evening, Mr. Morris Caruthers of Glendale who gave a very interesting talk on the family Pectinidae which he illustrated with fine specimens from his large collection. He traced nomenclature from the early days when the beautiful shells were included in the Ostrea family. Meeting was adjourned in the usual manner. Mary E. Turver, Secy. Pro. Tem.

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Mrs. H.E. Marsden, 2049 Ocean Way, Laguna Beach, Calif. is the new address.

Marshall Sohl Jr., 1435 W. 134th St., Gardena, Calif. is the new address.

Mrs. North McLean, Washington, Conn. We were happy to have a letter but sorry to hear that Mrs. McLean has been ill.

R. Verhaeghe, Berchem-Ste-Agathe, 84 Rue De L'Eglise, Belgium- Exchangers note " I am able to offer you specimens of European origin and principally those of Belgium, also earthly mollusca. ... I should be happy to receive a list of shells you wish to exchange."

. . . . New Publications Received

The Nautilus, Vol. 60, No. 1, July,1946. Of course, the most interesting paper to us is by Dr. A. Myra Keen " A New Gastropod of the Genus Episcynia Morch". This is both a new genus and a new species to be added to our faunal list. The data is Family Vitrinellidae Bush,1897; Genus Episcynia Morch,1875,: and the new species Episcynia devexa Keen,1946/ The type came from Scorpion Harbor, Santa Cruz Island, Santa Barbara Co., Calif. in 2 to 3 fathoms.

Dr. H.A. Pilsbryand Axel A. Olsson describe another species of this genus from Colombia- E. bolivari.

Another interesting paper is " Notes on Lamarck's " Prodrome" 1799 by Henry Dodge.

Dr. Pilsbry reviews the new publication " Supraspecific Groups of the Pelecypod Family Corbulidae" by Harold E. Vokes (Bull. Mus. N.H. vol. 86, pp. 1-32, 4 plates,1945). This is of interest to us because we decided to abandon the name Corbula and are using the name Aloidis Megerle von Muhlfeld 1811. Dr. Pilsbry discusses the validity of Corbula. We are not changing our decision until more convincing evidence is presented.

A new species of Conus is described by Maxwell Smith from Jamaica.

Other fine papers deal with the fauna of the other coast.

Papers of the Excavators Club vol.2, no.3 " The Use of Marine Mollusca and Their Value in Reconstructing Prehistoric Trade Routes in the American Southwest" by Donald B. Tower. This is a very interesting publication to us because the mollusks discussed all come from this coast. The paper consists of 56 pages of text, 1 plate map, and 6 plates of shells and shell ornaments. This publication should be added to all west coast libraries. If interested address The Editor, Excavators Club, Peabody Museum, Cambdidge, Mass.

Occasional Papers on Mollusks, The Department of Mollusks, Museum of Comparative Zoology, Harvard University, Cambridge, Mass.
vol. 1, no. 8, July 20,1946 " John Gould Anthony, with a Bibliography and Catalogue of his Species." 28 pp.
vol. 1, no. 9, Aug.2,1946 " Anodonta implicata Say" by Richard I. Johnson, 8 pp.
vol. 1, no. 10, Aug. 10,1946 " A Catalogue of the Genus Liguus with a Description of a New Subgenus" by William J. Clench.

All members having collections of Liguus should by all means get this up to date catalogue of the genus.

" From Linnaeus to Lamarck" by R. Winckworth (from the Proceedings of the Linnean Society of London, Session 157, 1944-45, pt. 1, 31 December,1945. This is an interesting paper comparing the systems.

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Dr. W.P. Woodring, United States Department of the Interior,Geological Survey, Washington 25, D.C. " Perhaps someone has already called your attention to the spelling of the family name on page 3 of your No. 52, Minutes. It should be Thaididae; the stem of Thais being " Thaid"- Dall's Latin orthography is generally unimpeachable, but he was sour on this one in Bulletin 112."

Dr. Woodring's correction is sincerely appreciated. It had not been called to the editor's attention before. Incidentally there is a paper in the current Nautilus " On the Naming of Families and Subfamilies."

Rediscovery of *Littorina newcombiana* (Hemphill),1876

As a collector of rare species by remote control Dr. G.D. Hanna of the California Academy of Sciences probably has no peer. After lunch and while visiting in Dr. Hanna's laboratory in San Francisco the editor of these papers casually mentioned a business trip to Eureka, California. Dr. Hanna promptly produced a map of Humboldt county and suggested that inasmuch as the trip and very low tides came together a search of the long lost species of Hemphill be made. The exact spot on the map was indicated with the observation that others had looked everywhere else around Humboldt Bay and perhaps this was it. The idea was to drive on to the town of Arcata north of Eureka and turn to the left driving out on a long strand past the small village of Samoa. This the editor accompanied by Mrs. Burch did and after parking the car we stepped down to the bank of the bay and picked up a number of the species with the first handful. The flat all along this strand is covered with salicornia which seems to be simply alive with *Phytia setifer* Cooper, and also with by far the largest specimens of *Assiminea* the writer has ever seen. While unable to detect any definite differences between those and the far smaller southern California specimens, the Humboldt Bay race should be carefully checked and studied to be sure that this is not a new species or subspecies of *Assiminea*. Our only described species is *A. translucens* (Carpenter).

No doubt Dr. Hanna will eventually advise us regarding the exact character of the *Littorina newcombiana* (Hemphill). In appearance it is much more like a *Lacuna* or even some of the brackish water genera. We brought back plenty for all to study.

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NOTE- In the last issue the editor suggested some cooperative dredging expeditions. The result was something of a deluge of letters from members and friends wanting in on the deal. Unfortunately the deal is still in the talk stage. However, it seems obvious that there are enough of us interested to warrant further investigation, and when all plans are made you will be advised.

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Dr. Raul P. Guitart, Kate Plumer Bryan Memorial School, Guines, Cuba. " I am preparing a paper on " The Edible Mollusks of America" and am soliciting information from every available source throughout the continents. I will certainly appreciate a list of the edible mollusks of California and any paper dealing with edible mollusks will be gladly welcomed. I will also appreciate very much the remittance of specimens of these mollusks."

Dr . Guitart also sent us some beautiful specimens of rare species of *Polymita* and *Liguus*. A separate of the paper by Paul Bonnot from California Fish and Game, vol. 26, no.3, pp 212-239 with many text figues " The Edible Bivalves of California " has been forwarded to Dr. Guitart with our compliments although it would be more proper to say with the compliments of the California Academy of Sciences because Dr. Hanna supplied both the reference and the paper.

Mr. Anthony D'Attilio, 102 Hilltop Acres, Yonkers, N.Y. " I must say you shell people on the west coast are very lucky with your club and groups."

Mr. Ramon Valencia, Capapan, Mindoro, Philippines. " I take pride in letting you and all other brother Americans know that the independence we coveted for centuries has just been given us July 4th. Americans have demonstrated before the whole world her magnanimity by fulfilling its solemn pledge first made in 1898 when Commodore Dewey took the islands from the Spanish conquistadores and second , when the Tyding-McDuffie law was enacted ten years ago. (con.)

But now that we are independent we face a big and serious problem. Our country is regretfully devastated and ruined by the enemy. Our homes were reduced to shambles and ruin. Those past three and one half years of enemy occupation has robbed us of all we once loved. But we suffered and sacrificed because we dearly love America. We value more than anything else the cause for which America fought during this war.- democracy.

My family especially has suffered beyond description. My son-in-law was an officer of the resistance movement, and as a result we had to remain in hiding to evade the enemy. Otherwise we would not have witnessed the dawn of a new day.

Much to my reluctance I feel constrained to suggest some aid in the form of clothing, even second hand. It is true that relief clothing coming from the U.N.R.A. has already been sent to this island but they are entirely inadequate to alleviate the need of a great majority of our people who badly need them.

Mindoro, the island where I live has suffered much from the enemy, and yet very little attention is given to this island by relief agencies. It will therefore be highly appreciated if you will solicit from some of your friends and other relief organizations relief clothing for us both children and adults. Anticipating whatever help you could manage and assuring you of my earnest desire to begin again collecting various kinds of shells for scientific purposes, I remain,"

Mr. Pedro De Mesa, Lubang, Minoro, Philippines. " I wish to thank you for the fine publication of the Conchological Club which was very helpful and has assisted me at this time of necessity. .. I have received packages from enthusiastic members of your club who knew of my present condition through your publication. ... The publication is indeed very interesting. I have read in it the whereabouts of persons with whom I had eagerly corresponded before the war and have long wondered where I can locate them. The clothing materials which I received sent by generous members of your club were welcomed by my children and grandchildren. They will be especially helpful during these rainy days. "....

A large box of very fine Philippine land shells has been received from Mr. De Mesa. There is no available list of the species although they are all carefully classified by Mr. De Mesa. Anyone interested in these may send the editor any contribution, these shells will be mailed back in full value and the entie proceeds less postage alone will promptly be remitted to Mr. De Mesa. The very least we can do is to help get such a fine conchologist back in the field.

Walter J. Eyerdam, 7531 19th Ave.,N.E., Seattle 5, Wash. Our member has again been spending the summer at the Oceanic Fisheries, Port Vita, Alaska. He reports that while he has collected comparatively few shells so far he has about 7000 sheets of plants all labelled and distributed. He will return to Seattle about the middle of October with shells both littoral and dredged as well as the plants. We look forward with interest to a list of the catach.

Robert R. Talmadge, 1736 L. Street, Eureka, California. " ... you may be able to help me in the classification of certain land snails of the Humboldt-Del Norte area. In this area the *Monadenia* are fairly common, as it is the meeting area of both the *M. fidelis* and *M. infumata.* In this area I also find some other forms of the *Monadenia* which I cannot classify. Perhaps you can tell me of some publication that I can obtain in order to classify the specimens. I have been using Keep up till now but can find no mention of those two forms that I have classified as different. I refer to thomas *M. humboldtia*

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similar to both M. fidelis and M. infumata, a dark brown color, and large, a distinct white lip, yellowish [illegible] rings radiating out [illegible], but the inside of the body whorl is a mottled white and purple, with no trace of banding, which I find in all phases of the M. fidelis. It is found in conjunction with both the others. The other I refer to as M. trinilalia, a small, light brown color, very rough, with prominent growth rings, that is collected only on certain rocks off of Trinidad, Humboldt county, Calif. I personally believe that I have two distinct forms that are undescribed. Due to the fact that there has been no real collecting or study of the land shells in this area. It is also my personal belief that both the fidelis and infumata are only color phases of the same form as both are found here on the same rockand tree. "

The above letter has just been received by the editor who places it here trusting that the Chaces and others will write Mr. Talmadge who will of course, also receive this issue of the minutes. Our only suggestion is the reference to Dr. H.A. Pilsbry, Monographs No.3, The Academy of Natural Sciences of Philadelphia, vol. 1, part 1, pp. 31-63. Dr. Pilsbry covered the group very thoroughly. However, it is difficult to suppress a smile at the suggestion that very little collectingand study has been done on this group and in that area. It has been the editor's opinion that it is a tribute to the profusion of nature that the entire genus is not extinct after seeing entire cabinets devoted to nothing but thousands of specimens of Monadenia.

Dr. L.A.W.C. Venmans, Bladel (N.B), Netherlands. Please note new address " Owing to your announcemnt many of your members have sent me boxes of shells but almost all marine. I do have a good collection of marine shells but for the past 5 years I interested myself more especially in land and freshwater mollusks, because contact with foreign countries was impossible and our beaches were unapproachable. For this reason my stock of marine exchange material is fully exhaused and I must let wait the collection of marine species for the present., till it is filled up. Land and freshwater species of all countries I am always able to exchange. ..."

Mr. Fred C. Hadden, Experiment Station, H.S.P.A., Honolulu, T. Hawaii. " My address will be temporarily as above. Then I shall probably go to Tutiula, Samoa for a long stay. Yes- the Minutes are being received and of interest to me. I have just finished packing all of my Guam shells and other things for I expect to go to Honolulu in a week or two. Whenever I can get around to unpacking them- probably after I arrive in Tutiula- I shall send the club some duplicates. Dr. Dan B. Langford has identified most of my material for me. He has the identifications checked by Dr. Thaanum in Honolulu. It all takes time- from 3 to 4 months to get the names back from Dr. Thaanum. The club may be interested in a preliminary report on the shells Dr. Langford and I have collected on Guam so far. We go out collecting for 2 or 3 days every two weeks, on the reef, when the tides are low. That is usually from 11 A.M. to 3. P.M. when it is nice and hot on the lea side of the island. Shells are not numerous here, except the following species which are fairly common: Thais sp., Conus lividus, C. flavidus, C. hebraeus, C. tahitensis, C. ceylonicus, C. aristophanes, C. catus, C. miles, Cypraea moneta, C. erosa, C. lynx, Drupa 2 sp., Strombus gibberulus, Nerita polita, Nerita sp. (white ribbed), Trochus small sps., Cerithium sp., Littorina scabra on mangrove roots , L. coccinea on rocks above high tide, and Bursa bufonia- but most of the shells are covered with lime or havea " green rot" so that only 1 put of 20 is worth while keeping.

Guam Shells:- Cypraea neglecta-1, C. hirundo-1, C. tigris -10, C. vitellus-10, C. moneta- 150, C. reticulatus-10, C. annulus-10, C. isabella-8, C. erosa-50, C. caput-serpentis-22, C. lynx-25, C. poraria-10, C. helvola-25, C. car-

(con.)

-acola-5, C. napa-1, C. talpa-1, C. scurra-1, Conus marmoreus-2, C. dist[illegible], C. miles-30, C. textile-6, C. striatus-10, C. omaria-9,C. flavidus-40, C. geographicus-10, C. ceylonensis-40;C. catus-15, C. pulicarius-10, C. hebraeus -60,C. arsitophanes-25,C. rattus-10, C. lividus-40,C. imperialis-1, C. vitulinus-6, C. sp. 6 sps. -10* Total Cypraea 17 sps. 340 specimens- Total Conus 22 species- 332 specimens* Other shells Persona anus-1, Tonna perdix-1, Thais sp.-40, Cassis vibex-2, Tridacna sp.-2,Margarita margaritifera-1,Pterocera aurantia-2,P. lambis-4,Pinna sp.-6, Turbo sp.-6, Turbo intercostalis-2, Drupa horrida-23, D. digitalis-33, Drupa sp. 4, Strombus gibberulus-40, Strombus sp.-4,Bursa bufonia-2,Bursa sp.-4,Nerita polita-60, Nerita sp. (white ribbed)-50,Murex sp.-10, Cerithium sp.-5, and 20,Terebra sps. 5, Latirus sp.-6,Scarabus sp.-20, and 30,Trochus sp.-10,Collana sp-20, Vasum sp.-26,Amplustrum amplustre-1,Coralliophila sp-10, Mitra sps. 12,Cardium unedo-1,Arca sp.-4,Asaphis deflorata-2,Tellina sp.-2,Littorina scabra-20, L. coccinea-20, Iopas sp.-10,Partula gibba-4, P. radiolata-4,Achatina fulica -80,Partula sp.-6.

Achatina fulica, the large African snail- many are 5 inches long and 3 inches thick are numerous at 3 localities on Guam, Avigua, Santa Rita and Etton. It is very destructive to manycrops. We have killed at least 100,000 per month for the past 3 months with " Metag Bait". This month, now that we more Metag has arrives we will probably kill 4 or 5 times as many. The African snail is very fond of pumpkins, squash, (all cucubits), corn,Chinese cabbage, papaya etc. We have 80 Japanese prisoners of war spreading the metag and cutting trails around and in the infested area. The area at Santa Rita and Etton are about 2 miles around and that ar Avigua is only 5 or 10 acres- but partly on a cliff. There is considerable jungle and grass land in all areas. Over 15 tons of Metag has been used so far, and 25 tons more have been ordered. We feel we are confining the snails to the areas infested to a large extent and that we are reducing them in numbers. Achatina fulica is very numerous over Rota and Timan islands. It is almost omniverous. One snail may deposit 400 eggs at one time. Dr. Langford is working out their life history, food plants etc. The eggs take 5 days to hatch. Theyare the size of buck shot. A large 3" snail can travel at least 50 feet in one night and will climb 20 feet up into a papaya tree to eat the ripe fruit and leaves.

The land shells (Partula)do not seem to be confined to any one species of tree, many are found on the pandanus and other native plants. They are also killed by the Metag. I have found Scarabus only on the trails where metag killed them.

So far we have not found any live Oliva or Polinices , although we have seen the peculiar egg capsules of the latter. They must be around somewhere. This may not be the season for them. I shall have more to write latwr from Tutiula or Honolulu."

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AQUARIUM NEWS- Conchologists are amazed when they take a peek at one of the marine aquariums in San Diego. The owner took a batch of living Norrisia norrisii and dropped them into muriatic acid. The animals closed their operculums tightly of course and the acid did not penetrate and kill the animals. In a short time they were pearled and as beautiful as any polished pearl. They were then washed off placed in the aquarium with their favorite kelp for food. It is still amazing to behold these beautiful pearled snails crawling about as if nothing had happened to them.

New Publications Received

W.P. Woodring, M.N. Bramlette, and W.S.W. Kew " Geology and Paleontology of Palos Verdes Hills, California ", Geological Survey Professional Paper 207. This is an intensely interesting paper to all local collectors. 145 pages, 37 pages of plates, and a pocket of maps. Most of us will be at hoome on every page recognizing both the localities as wellas the species discussed. It is certain that all local collectors will read this work with pleasure.

Annual Report of the Chicago Natural History Museum, 1945 is an imposing report of 135 pages containing a great deal of interesting material.

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Minutes of the Conchological Club of Southern California- September,1946

The Conchological Club met at the usual place at 7:30 P.M. Tuesday even--ing, Sept. 3rd. The meeting was called to order by our president Dr . W.O. Gregg. There were 21 present including two visitors. No reports of committees. The meeting was turned over to Mr. G. Kanakoff who gave a most interesting report on a scientific expedition to all of the channel islands in 1939-41 just 30 days after Pearl Harbor. They made their own mapsandcharts. San Miguel Island very picturesque but water bad, only snails on this slope but very abundant and variable species, gathered about 2000 of them, found few fossil deposits. Santa Rosa Island- only one of value found here was helminthoglypta ayresiana(Newcomb),1861. Not much material from Santa Cruz Island, 7 kind s of bats.Plantsand insects numerous. San Nicolas island more interesting than the others, very sloping on one side and an abundance of snails both living and fossil for comparison. Ice plants all over north side but rare on south side. Made two trips to San Clemente- 3,000 species taken. Mr. Kanakoff found an interesting cave which contained Spanish beads of glass, pieces of china, and a throwing stick which he is very proud of- one also was found in 1884 and is now in the British Museum. We were gladto welcome back Mr. & Mrs. Chace and Mrs. Burch who all had a nice vacation and collecting trips they will tell us more about next meeting. The Chaces told of having all the abalone they could eat- they also collected a number of Petricola pholadiformis at Willapai Bay, Wash.- each member present was given a nice pair. Mr. & Mrs . Burch had been in San Francisco, wmet on a collecting trip with Allyn Smith. Mrs. Burch proved to be the best collector and didnt have to leave the car to find a treasure. Mary E. Turver- Secy. Pro.-Tem.

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New active members of the Conchological Club.

Edwards, H. Ardon, Southwest Museum, Los Angeles 41, Calif.
Hegner, Carl, 1904 Noldon St.,Los Angeles 41, Calif.
Howard, Dr. Arthur D., 2307 W. 20th St.,Los Angeles, Calif.
Malloy, Mr. John and Ione, 6405½ Victoria Ave.,Los Angeles, Calif.
Reis, C.O., 464 Juanita Ave., Los Angeles 4, Calif.
Tompkins, Mrs. John K. , 520 S. Santa Anita, Pasadena 10, Calif.

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Bauman,Albert, 1723 W. 154th St., Gardena, Calif. This is new address.
~~Mr. and Mrs. H.R. Turver~~,8640 Evergreen Ave.,South Gate, Calif. is the home of Mr.and Mrs. H.R. Turver who are now on another collecting trip to Mexico.
Dr. Wm. J. Clench, Harvard College- "I am now deep in Thais- a job with plenty of troubles //- However, we are getting along nicely."

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
November-December 1946

These papers are published by a group of interested students for our own pleasure. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, any person or institution will receive all papers published by our club by contributing $2.50 per year or more to our fund. Expenses are defrayed by voluntary contributions of members and friends.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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New Publications Received

In our Minutes #63 pp.9-10, we gave a review of some of the publications of Dr. E. Leloup of the Musée Royal D'Histoire Naturelle De Belgique. Our first report covered only his papers dealing with the fauna of our own coast. However, we are now in receipt of a number of other fine papers by this author whose works will be a prime necessity for the serious student of this group.

" A Propos De Quelques Acanthochitons Peu Connus Ou Nouveaux". We now have in our library four parts of this treatise. We discussed part III dealing with " Region Pacifique, Cotes Americaines". The other parts are I. "Region Indo-Pacifique" , 1941, 19 pp, several plates; II " Region Atlantique",1941,15 pp.; IV " Region Pacifique Occidentale" 10 pp, 1 pl.

" Resultats Scientifiques Des Croisieres du Navire-Ecole Belge "Mercator", II Polyplacophora par E. Leloup,1941. This paper describes new species and deals with the chitons from off the coast of Columbia.

" Deux Nouvelles Especies De Polyplacophores, Cryptoconchus ashbyi et Cryptoconchus roseus",1940 , 7 pp numerous plates. Material from Australia and China.

" Quatre Ischnochitons De Tsingtao (Chine)",1941,15 pp, 2 pls., numerous text figures. In this paper one of the species is Ischnochiton (Lepidozona) berryanus named for Dr. S.S. Berry.

" Les Chitons Du Genre Cryptoplax Blainville,1818",1940 32 pp, 3 pls., many text figures.

" A Propos Des Especes Du Genre Squamopleura Nierstrasz,1905 "Amphineures).

" Quelques Chitons des iles Maurice et Salomon,13 pp, 1 pl, 7 text figs. Mauritius Institute Bulletin,vol.II, pt.1,Jan.1941.

" Revista De La Sociedad Malacologica " Carlos De La Torre", vol.4, no.2, Agosto de 1946.

The excellence of this publication from Cuba is amazing. It is certainly an essential to the student of the West Indian fauna. New species of both land and marine mollusks are regularly described and beautifully figured.

" Proceedings of the Malacological Society of London", vol.27, pt.2,Sept., 1946. While there are as usual many fine papers in this issue there are none dealing directly with the fauna of this coast.

" The Naturalist's Directory" by The Cassino Press, Salem, Mass has been delivered. Many of our members are listed in it. However, it covers naturalists in all fields with necessarily a small percentage interested in conchology.

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Minutes of the Conchological Club of Southern Calif.- Oct.,1946

The Conchological Club of Southern Calif. met at the Los Angeles Museum Oct.1,1946. The meeting was called to order by the president, Dr. W.O. Gregg. There were 19 members present. The club was presented with a new hand made gavel to replace the last one that was made for the club by Emory Chace and has been in use for many years. This too is hand made by its donor, Mr. Carl Hagner and much appreciated by the club expressed by unanimous applaus. Mrs. Burch reported a letter from the Edwards family giving their new address at 1933½ Russell St., Berkeley 3, Calif. and asking visiting members to call. She also reported Dr. Tom and Beatrice Burch are well and enjoying their new work with the Pan American Sanitary Bureau at Guatemala City, Guatemala. John Q. himself is travelling in northern California and will be gone for some weeks. His address is room 230, 742 Market St., San Francisco. Mrs. Chace reported a letter from a long time member, E.J. Post now at 609 W. Emma St., Tampa 3, Fla. and stating that his health is now sufficiently improved to allow him to do some collecting. Mention was made of a number of new publications which will doubtless be reviewed in the minutes. The club was given a look into its past by our historian Elsie M. Chace. She told with a number of amusing details of our growth from a rather exclusive society, often moving about, housed here and there up to the present. It was interesting to the oldsters and sometimes surprising to the new members. Following her paper one was given by Emory P. Chace, as scheduled, and relating the experiences and successes of a recent trip many of us would like to make. They went all the way up the coast to Puget Sound and backagain with ' finds' on both land and shore that would seem to well reward the no inconsiderable efforts needed to secure them. Always generous he brought a goodly sized box of their finds to share with us who had not been so fortunate. From start to finish the program had the eager attention of all and we did not go home until our time limit compelled us to do so. Effie M. Clark- Secretary.

November Meeting

The Conchological Club of Southern California met at the usual time and place, Nov.5,1946 and were called to order as usual by the president Dr. W. O. Gregg. There were 18 members present. Miss Edna Cook who has been unable because of illness to attend meetings for some time , but who for many long years rarely missed a meeting, sent greetings to the club. They in return sent her their sincere wishes for a return to health which would permit her to again be with us. John Burch reported the receipt of quite a number of

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recent conchological publications which will be reviewed elsewhere. Dr. Gregg appointed a nominating committee to report at the December meeting. They were Mr. Chace, Mr. Caruthers, and Mr. Kanakoff. The announced subject scheduled for the meeting- fresh water mussels was then taken up by Dr. Arthur B. Howard of the Hancock Foundation, U.S.C. This report of a long and difficult investigation of the life history and distribution of fresh water mussels was most interesting and to all but a few of the higher ups among the fresh water enthusiasts, was also most enlightening. The fact that young of these bivalves depend for their very lives on a number of varieties of fish and an occasional mud puppy made front page news to the secretary, and I am quite sure as well to a goodly number of those present. The studies of their embryonic lives and their differences were so well illustrated by charts, and the beautiful colored pictures of the various fishthat were so necessary to their livingat all, made the talk both enjoyable and unforgettable. Any of the members who missed this meeting missed a real educational treat. There will undoubtedly be other at future meetings of equal interest to those who, because of war time restrictions have gotten out of the habit of attendance at our meetings. It was moved, seconded and made unanimous that we thank Dr. Howard for a most interesting talk. Effie M. Clark- Secretary.

REVISED LIST OF ACTIVE MEMBERS

Pursuant to Article XI of our Constitution, the following revision of our list of Active Members is in order.

Bagley, Mrs. Laura B., 1119 Arapahoe St., Los Angeles 6
Baker, Mr. and Mrs. E.P., 417 S. Downey Ave., Downey, Calif.
Bauman, Albert, 1723 W. 154th St., Gardena
Brookshire, Jack W., 948 Beverley Blvd., Bellflower
Burch, Mr. and Mrs. John Q., 4206 Halldale Ave., Los Angeles 37
Caruther, Mossis E., 120 E. Chestnut St., Glendale 5
Chace, Mr. and Mrs. E.P., 24205 Eshelman Ave., Lomita
Clark, Mrs. Effie M., 403 S. Mariposa St., Los Angeles 5
Cook, Miss Edna T., 1002 N. Hobart Blvd., Los Angeles 27
Cornett, Mrs. Mary, 2229 Griffin Ave., Los Angeles 31
Edwards, H. Arden, Southwest Museum, Los Angeles 41
Gillis, Mr. and Mrs. A.W., 1904 N. Madison Ave., Pasadena 6
Gregg, Dr. Wendell O., 2200 S. Harvard Blvd., Los Angeles 7
Hegner, Carl, 1904 Nolden St., Los Angeles 41
Hill, Dr. Howard R., Los Angeles Museum, Exposition Park, Los Angeles 7
Howard, Dr. Arthur D., 2307 W. 20th St., Los Angeles
Howard, Mrs? Faye B. and Jerry, 212 Locust St., Inglewood
Kanakoff, Geo. P., Los Angeles Museum, Exposition Park, Los Angeles 7
Liebaugh, Conrad C., 707 S. Clark St., Bellflower, Calif.
Mallow, Mr. John and Ione, 6405½ Victoria Ave., Los Angeles
Price, Arthur C., 2618 Wellington Rd., Los Angeles
Reeder, Bill, 4725 Brynhurst Ave., Los Angeles 43
Rois, C.O., 464 Juanita Ave., Los Angeles 4
Shumate, Miss Agnes J., P.O. Box 474, Ocean Park
Smith, Dr. A. Haven, 222 N. Pine St., Orange
Strong, A.M., 215 W. 5th St., Room 1212, Los Angeles 13, Calif.
Tompkins, Mrs. John A., 520 S. Santa Anita, Pasadena 10
Turver, Mr. and Mrs. H.R., 8640 Evergreen Ave., South Gate
Wright, Dr. Charles R., 601 O St., Sanger

- Dr. W.O. Gregg and Morris E. Caruthers- Chairman Membership Comm.

THE FRESH WATER MOLLUSCA OF CALIFORNIA

Data is now being compiled on our list of fresh water mollusks which in due time will appear in the Minutes. A definite form will be followed: Name, reference to original description, description or descriptions, type locality, distribution, distribution in California and other important information. At this time it is particularly desirous to obtain the original descriptions of the following: Anodonta beringiana Middendorff, Anodonta nuttalliana Lea, Anodonta dejecta Lewis, Gonidea angulata (Lea), Sphaerium dentatum (Haldeman), Sphaerium primeahum Clessin, Sphaerium californicum Clessin, Musculium steini (A. Schmidt), Musculium hanhami Sterki, Pisidium occidentale Newcomb, Pisidium insignae Gabb, Pisidium angelicum Rowell.

Copies of the originaldescriptions of the above will be greatly appreciated and will materially aid us in this project.- Dr. Wendell O. Gregg, 2200 S. Harvard Blvd., Los Angeles 7, Calif.

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Carl Hegner, 1904 Nolden St., Los Angeles 41, Calif. Mr. Hegner is a new but very enthusiastic member of the club.

Hulda Magalhaes, Box 496, Bucknell University, Lewisburg, Penna. The former address was Duke University. " I am still hoping to get a paper published early next year on my work with Busycon at Beaufort. I have begun to collect some data on the subject of sexual dimorphism in that genus, but as yet I do not have sufficient evidence on which to base definite conclusions. "

Quintin A. Eala, Chief, Scientific Library,Bureau of Science, Manila, Republic of the Philippines. " Thank you for copies of your clubs " Minutes". We are classifying and cataloguing this series sothat its contents are made readily available to our conchologists."

Wm. G. Fargo, is now at his winter address P.O. Box 874, Pass-a -Grille,Fla.

Dr. C.M. Fox, Siota,Solomon Islands. We have published several letters from Dr. Fox and perhaps some of our members failed to note the article in the September Readers Digest entitled " Hari Poagi and His Ex-Canibals." This deals with the life of Dr. Fox in the Solomons.

Professor Willis G. Hewatt, Texas Christian University,Fort Worth,Texas. " The long delayed report on my 1939 marine studies on Santa Cruz Island, California, is in the press and will appear in an early issue of " Ecological Monographs".

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We were all of us friends of Dr. B.R. Bales of Circleville,Ohio and his humerous and happy letters will be sincerely missed. A number of members have written us reports of his death but the following letter from Miss Adele Koto seems to be a tribute to " Doc" that should be repeated. " I am writing this letter to tell you that Doc Bales died, in case you had not heard. He died last Friday, Oct.25, after being confined to his bed a week. He suffered a cerebral hemorage a week before he passed away. It certainly was a shock to Dad and myself, and I know it will be to everyone who knew Doc. We have always considered him the best friend we ever had. We have spent about 8 winters together in Florida, being with the Bales almost continuously, day and night. I have never known anyone that has brought so much happiness to people, old and young alike, and had suchba keen understanding of human nature. With Doc around there was never a dull moment, as his wit was always a going. Last winter he was not so very well, and could not go out collecting, but he made the best of it, and was always the " life of the party." He knew every--body down on the Keys and everyone knew him, and they all wanted to be around him. It is going to be a shock to all his friends as everyone will miss him,but we have his ideals to live up to, and the knowledge that if he couldn't be well and his old self, he is a lot better off, and he would want it that way."

Fred C. Hadden, c/o N.E.A., Navy # 3247, c/o Fleet P.O., San Francisco, Calif
The above seems to be the latest address for our former member in Honolulu.

Mrs. Margaret Teare, 681 Lafayette Ave., Buffalo, N.Y. " It was nice to have met Mr. Andrew Sorensen and his charming daughter at the A.M.U. convention in Washington last August. Sorry more of the California members did not attend. It was my first meeting and I found it very interesting and met so many charming people and was especially pleased to meet so many young members."

Mr. Paul P. McGinty and Sons, Boynton Beach, Fla. also wrote us of the death of Dr. Bales " We saw Doc last about the middle of last April when he was on his way home from having spent the winter at Marathon on Key Vaca. Have not had a letter from Mrs. Bales since his death and do not know her plans. Notice that Tom and family are to spend some time in Guatemala. Only wish that our friends (Mr. and Mrs. F.J. Barcroft) were still there but Mr. Barcroft was only recently transferred to Lima, Peru. Mr. B. married Dr. Pilsbry's youngest daughter."

F.R. Aldrich, Box 155, Bay Island, Balboa, Calif. " You will pardon me for delay in answering your letter. I have been in the hospital undergoing repairs with an operation and am slow regaining strength but am coming out of it very nicely and now put in a few hours each day in the Laboratory. Regarding the Glottidea, while we have them in a soft green tint which are very scarce and few, I hesitate to send them in for inspection on account of injury or loss of the anchor stem which are now in perfect condition."

Mr. Aldrich has specimens in his collection of a green Glottidea collected in Newport Bay. It was my opinion that these are of a different species from our common Glottidea albida Hinds. They should be studied. John Burch.

Walter Calleja, 23 New St., Borgebbugia, Malta. This is a new address for Mr. Calleja who writes among other interesting things " Yes- I am still collecting shells and will be pleased to make exchanges with anyone who is interested in the matter; but I wish to explain to shorten many delays; who is willing to make exchanges it is better to send a parcel of shells instead of letters asking me if I am disposed to make exchanges and so on. It is to be remembered that the postal service is very slow, and require two months and a half for a parcel to arrive." Incidentally, the editor recently received a fine box of first class shells from Mr. Calleja.

Mrs. Aurora Trethewey, 204 Emerald St., Fontana, Calif. This is a new address until further notice. Mrs. Trethewey has maintained her home in San Diego.

Mr. Roy L. Morrison, 3745 Grim Ave., San Diego 4, Calif. " .. expect to make some collecting trips in Dec. during the low tides."

The Grammas are wintering in Bradenton, Florida.

Mr. Joseph S. Gaylord, 3011 Burlington Ave., No., St. Petersburg, Fla.
The above address until April.

Kathleen and John Dyas Parker, Muskogee, Oklahoma announce the arrival of Kathleen Jane Parker. The young lady can scarcely miss being an ardent naturalist.

Mr. H. Carroll McGowan, Rt.1, Box 173A, Hollister Ave., Santa Barbara is to be congratulated on his recent marriage to Miss Margaret Steen Steadman.

W.T. O'Gara, Tropical Oil Co., Bogota, Colombia. We are happy to have a nice long letter. He is doing Macropaleontology for the field parties doing exploratory geology thoughout Colombia. He mentions another from our section " We have here in the laboratory Mr. C.D. Redmond formerly a resident of Bakersfield and a graduate of U.C.L.A. He has attended meetings of the Conchological Club of Southern California. He sends his regards."

Norman W. Gardner, Mauku, R.D., Pukekohe, New Zealand. " Firstly I must thank you very much indeed for inserting my notice in the monthly paper of your club. It is really good of you. I have had replies from all over the U.S. Yesterday the mailman handed me one from Holland, so I have great hopes of building up my land molluscs.

Dr. Hand Friedrich, Muenchen 8 (13b), Schneckenburgerstr, 15 I, Bayern- Dr. Friedrich is the first of our former correspondents in Germany from whom we have heard. He states that 3 bombs exploded near them and did a lot of damage but did not kill anyone in the family. He sends a fine list of exchange material, but of course, is only interested in first class specimens in exchange He asks to be remembered to Mr. M. Caruthers and tothe Conchological Club. He is still alive and still wishes to exchange shells.

Natural History Museum, Balboa Park, San Diego, Calif. Dr. Joshua L. Baily Jr. in a recent letter advises that while the museum has been given back to the city by the navy the restoration of the buildings cannot be undertaken because the material is not available. However, the research departments are still working. The editor of these papers had the pleasure of a recent visit to San Diego and spent a pleasant afternoon at the museum. The monthly Bulletin of the museum announces three new items under aquisitions, one of a rare fossil *Turritella goniostoma* dug from the Frontier Housing project on Pt. Loma. The species is living Recent in the Gulf but not known from California. Another gift of a fine lot of Alaskan material and an exchange involving 162 specimens sounds very much as if Miss Bristol, the curator, is keeping very busy indeed.

Professor Trevor Kincaid, University of Washington, Seattle 5, Wash. " When I look over the material you have been sending me I begin to realize what a lot of work has been involved in the reparation of the data long before it is shaped up for printing. " Thanks for the compliment as wellas the very generous contribution to our fund.

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If you have some really fine material for exchange this looks as if you should take notice.

The National Museum, Russell Street, Melbourne C.1, Victoria, Australia.
(a) Would you please register our museum as being avilable for exchange purposes for specimens of mollusca?
(b.) Would you please note that we can offer the Memoirs of this Museum as [illegible] exchange for literature ?

Letters should be ad ressed to Mr. R.T.M. Pescott, Director.

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Harry C. Magnus, 510 43rd St., West Palm Beach, Florida. The editor recently received an interesting gift from Mr. Magnus. It was a fine specimen of *Fasciolaria gigantea* but with a plaster cast of the animal extended and colored a deep red which I assume if the color of the animal. I have never seen a living specimen. He reports that his eyes will not permit him to do the close work required to study the microscopic material he has been so much interested in. He also send me several shell vials of the microscopics.

R. Verhaeghe, Berchem-Ste-Agathe, 84, Rue De L'Eglise, Netherlands. We have a very interesting list of duplicate species offered in exchange involving separate lists of marine, land and fresh water species. He is interested in aquiring a large series from this country by exchange

A.G. Stevenson, 32 Pentland Ave., Mt. Eden, Auckland S. 2, New Zealand. " .... The work you are doing on the shells is particularly useful to us over here.". Mr. Stevenson sends out beautiful specimens in his exchanges. You will not be dissapointed if you are fortunate enough to get him as a correspondent.

New Publications

" Eastern Pacific Expeditions of the New York Zoological Society. XXXIV. Mollusks from the West Coast of Mexico and Central America. Part III." Leo George Hertlein and A.M. Strong.

We are delighted to have these fine papers coming to our desk again after having been held up throughout the war. Others are expected to follow with regularity. This paper is of particular interest to California collectors becaus a number of the species discusses extend their range up the coast into our fauna. The following are of note since they will involve a good many changes on our labels.

Ostrea palmula Carpenter- While it is true that in our Minutes #64, p.11 we stated this conclusion it was on the advice of the above authors. The species we have been labelling O. palmula is in reality Ostrea lurida laticaudata Carpenter with O. palmula ranging from San Ignacio Lagoon, Lower Calif. southward.

Lima(Limaria) hemphilli n. sp. is the new name for the shell we all have labelled L. dehiscens Conrad. L. dehiscens was described from the Azores. Comparison of specimens from the Azores with those from this coast show definite differences according to the authors.

Lithophaga plumula kelseyi Hertlein and Strong is the name given the species from the California coast. The authors differentiate the two giving the range of L. plumula s.s. from San Ignacio Lagoon, Lower Calif. southward.

" The Operculate Land Mollusks of the Family Annulariidae of the Island of Hispaniola and the Bahama Archipeligo.", U.S. National Museum, Bulletin 192, by Paul Bartsch.

This is an exhaustive monograph on this group consisting of 264 pages, and 38 pages of plates.

" Leaflets in Malacology", Vol. 1, No. 1. This is a new publication owned and edited by Dr. S.S. Berry, Redlands, California. Dr. Berry has the best wishes of all for the success of the new publication.

In this issue Dr. Berry describes as a new species the shell we have frequently mentioned in these Minutes as Pediculariella californica (Newcomb), collected off Catalina Island on the Farnsworth Banks by Mr. S. Jacobs. Dr. Berry gives this southern California shell the new name of Pedicularia ovuliformis n. sp.

The only discussion we have is that in our proceedings we accepted the conclusions stated by Theile in 1925 that he had found the species from this coast differing from the genotype of Pedicularia (P. sicula Swainson), anatomically and for this reason had given the new generic name Pediculariella to the species from this coast. We accepted the work of Thiele. Dr. Berry does not mention Thiele's Pediculariella, and we propose therefore until we have been advised by someone having made a study of the soft parts of the two, to enter Dr. Berry's new species in our collection as Pediculariella ovuliformis (Berry),1946.

We stated on the advice of Dr. Fritz Haas that the hydrocoralline on which this new species is found is Allopora californica Verrill, but Dr. Berry has the name Allopora venusta Verrill given him by Dr. W.K. Fischer. The fine distinctions between species of such a complicated group must be a problem for the specialist.

" The Shellfish of New Zealand" by Dr . A.W.B. Powell of the Auckland Institute has been revised to date (July,1946). Indispensible for students of the New Zealand fauna.

" Geology and Paleontology of Palos Verdes Hills California", Geological Survey Professional Paper 207 by Drs. W.P. Woodring, M.N. Bramlette and W.S.W. Kew, 1946- For sale by the Suprintendent of Documents for $1.50.

This fine work in 145 pages, 10 pages of plates, many text figures, map etc. is not only indispensible to the student of the fossil species , but discusses the relationship between the fossil and the Recent on many fine points. This work will be cited as authority with great regularity.

" A Shell Necklace From the Havasupai Indians", Plateau, Published by the Northern Arizona Society of Science and Art, Flagstaff, Arizona, by Dr. S.S. Berry. This is a very interesting paper to students of the land fauna of that region the necklace having been made of Oreohelix yavapai fortis Cockerell.

" Shell Notes" by Frank Lyman, Lantana, Florida. Vol. 1, No. 18. In this issue Frank manages to keep his paper cramed with interesting data. I have never had the pleasure of meeting Frank personally but I can see that if we did meet we would probably kill a few days arguing about the best methods of dredging at different depths and on rock, coral, mud etc. I have yet to meet two dredgers who use exactly the same ideas, and each marvels at how the other fellow can possibly get so much material the way he gets it. Anyway we all wish the best of luck to the Junonia, long may she float. Our dredging boat which we are sorry to have sold during the war we named The Janthina also after a beautiful shell.

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We have a letter from Dr. Richard W. Foster of the Museum of Comparative Zoology asking a verification of the dates of publication of the early issues of our Minutes. The data follows although, of course, the first issues were largely confined to current news. A few good papers were published. No.1, July,1941- No.2, Aug.,1941- No.3, Sept.,1941- No.4, Oct.,1941- No.5, Nov. 4,1941- No.6, Dec.,1941- No.7, Jan.6,1942- No.8, Feb.3,1942- No.9, March 3, 1942- No. 10, April 11,1942- No.11, May 5,1942- No. 12, June,1942.

From this point to date each issue has been numbered and dated.

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We recently received some albino specimens of Oliva from La Paz, L.C. Unable to find a name for these shells they were submitted to Dr. E.W. and D.S. Gifford of Berkeley who specialize in this family. Their comments follow: " We have nothing in our collection to match your two albino spicata. We could find nothing in the literature exactly like them. The nearest approach is the form mariae Ducros, but it is not an albino, though a light colored form. See Tryon, Man. of Conch., vol.5, p.82. Vanatta, Nautilus, vol.29, p.70, says: " Var. maria Ducr. This is a very light colored form much like var. venulata. Tryon M.C. pl.29, f.78; Chemn. Ill. Conch. pl.33, f.11."

They also ask " Did you find any Olivella pycna at Crescent City ?" The editor and Mrs. Burch did collect O. pycna at Crescent City on the sandy beach at minus tide directly north of the Crescent City breakwater. The only unusual comment here is that our experience has been to find O. pycna in separate colonies. These were taken in the middle of a large colony of O. biplicata, but on about the ratio of one pycna to several hundred biplicata .

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Mrs. Effie M. Clark advises that she has recognized Odostomia (Evalea) aleutica Dall and Bartsch,1909 taken from Haliotis rufescens brought into the market at Monterey, Calif. If verified this is a vast extension of range.

Minutes of the Long Beach Shell Club Nov.,1946

The Long Beach Shell Club met in the basement of the Lincoln Park Library,Nov.10. The minutes were read and accepted. The club voted to pay the dues to the Shell Minutes in advance, and make an additional contribution to the editor of the publication as we had received the Minutes so long in the past without any cost.

Mr. Chace reported collecting on the San Pedro breakwater and finding only about 15 species when in the past so many more were obtainable. Mr. Carl Hegner joined the group and reported that the low tide of yesterday had uncovered the rocks near San Pedro more than he had seen for some time. Mrs. Libby is still not able to be with us, and in her absence Mr. Baker introduced Mr. E. Kanakoff of the Los Angeles Museum, who spoke on the studies being made on the Upper Pleistocene of the Santa Ana and Newport Bayregion. Many interesting features of the area were discussed by our speaker. Marshes, divided by the Irvine Estate near a salt works, have never been touched by anyone. 60 species of shells were taken in this area. Where the end of the sea had been was Mr. Kanakoff's special point. Dr. Clemens of U.S.C. has an actual map of the area, based on dredgings of the Hancock expeditions, when 900 different holes were made. The Miocene was an uplift and this the point where the Santa Ana river emptied. Much misplaced material was shown to be present from which material from other ages have been revealed. The material at the end of the sea is characteristic of a warm area. Dr. Willett described 10 new species of Venerupis, one a red margined one, which was likely an adult shell of a Playa del Rey deposit. 40 ft. of deposits revealed layers of periods, cross sections of animal species, birds,fish,worms,sponges,porifera, foraminifera,bryozoa,barnacles, round worms, and on the opposite side of the bay was crab material, and deeper down was colder water material.Certain material like the jaw of a taper, tells that there have been layers of a period the same as Rancha La Brea and changes in the earths surface in ages past put both materials together. All of Mr. Kanakoff's talk was illustrated by maps and recovered material, and was one long to be remembered.

Notice was made of the Christmas meeting at the home of Mr. and Mrs. Ulrich, when shell gifts will be exchanged. A gift of shells from one of the men in the library will be divided among the members present at that meeting also. Ruth E. Eaton, Secretary.

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Dr. Asela B. Franco,Cebu City, Philippines. " The Illustrated Glossary" is very helpful for one like me and I am sure it is refreshing for the more advanced collectors. I must congratulate Mrs. Burch and you for the splendid work. Your Minutes of the Conch. Club is interesting reading.

How can I get a copy of Henry Dodge's " Notes on Strombus dentatus L. and the Strombus urceus Complex ? * Note* I suggest that a letter to Mr. Dodge, 6 Rochambeau Rd.,Scarsdale, N.Y. would promptly get the needed paper.*

When was your C.C. of S.C. organized ? * The club has been in existence for something over 50 years*

Dr. Jeanne S. Schwengel,260 Marmaroneck Rd.,Scarsdale,N.Y. The editor here and Mrs. Burch enjoyed a full days visit, a treat we have too rarely of meeting our friends from the other coast.

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Part 1, Vol.11 of " Land Mollusca of North America" (north of Mexico) by Henry A. Pilsbry (our Monograph series No.3), will be off the press this fall: part 2- probably next year. (This last part completes the work).

Part 1, $13, part 2, $12.00. The above notice from the Academy of Natural Sciences,19th & the Parkway,Phila.3, Pa.

The above work is of course absolutly indispensible to the student.

Having concluded our discussion of the Pelecypoda, Scaphopoda and Gastropoda, we have three large volumes under one index which we offer to those interested for $5.00 per volume.

We have attempted a discussion of the taxonomy and distribution of all described species from San Diego, California to the Polar Sea although in addition we have keys to most of the genera and species of the entire coast. The format is mimeograph with hundreds of text figures and some photographic plates. The volumes are bound in paper covers.

In this work covering a period of years, we have endeavored to reprint in full all original descriptions, either not included in Oldroyd " Marine Shells of the West Coast of North America" or that have been published since the publication of Oldroyd in 1927. Therefore, the owner of a set of Oldroyd and our work should have the original descriptions of all west coast species. The Oldroyd is still available in paper in four volumes for $8.50. We will be glad to have your order for this work also.

Part I. Pelecypoda	$5.00
Part II, Vols. 1 and 2	10.00
Illustrated Glossary of Terms Used in the Study of Pelecypoda	1.00
Check List of West North American Marine Mollusks	1.00
Annual Subscription to the Proceedings of the Conchological Club of Southern California	2.50

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Z39.48-1992 (Permanence of Paper).

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